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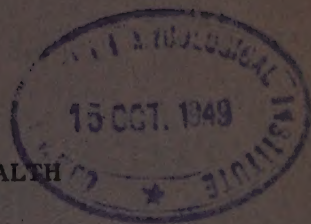
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DISEASES CAUSED BY BACTERIA AND FUNGI

GILLESPIE, W. A., & SIMPSON, P. M. (1948.)
**Pathogenic staphylococci. Detection of α -lysin
production on rabbit and sheep-blood agar
plates.—*Brit. med. j.* Nov. 20th. 902-903. 1417**

Two per cent rabbit or sheep-blood agar plates were streaked with seed material in parallel lines in one direction and incubated overnight. Strips of sterilized filter paper dipped in α -antitoxin and dried were then laid on the cultures with the long axis at right angles to the culture growth. The plates were incubated in an atmosphere containing 30 % carbon dioxide and read after 24 and 48 hours. With strains producing α -toxin there was a wide zone of lysis, which tapered sharply towards the filter paper. The presence of other lysins did not affect the result. This test was closely correlated with the tube α -toxin tests, the coagulase production and the clinical pathogenicity of the strains.—J. I. TAYLOR.

FOGGIE, A. (1948.) **Experiments on the protection of lambs against tick pyaemia by the use of staphylococcal toxoid.—*j. comp. Path.* 58. 24-37. 1418**

Injections of staphylococcal toxoid into ewes prior to lambing produced a high anti-haemolytic titre, which dropped rapidly. The passive immunity conferred upon the lambs declined steadily from the first week after birth and was not sufficient to protect them against natural or artificial infection.

The production of anti-haemolysins in response to staphylococcal toxoid did not occur before the age of 25 days and only a proportion of lambs reacted between the ages of 25 and 40 days. As the incidence of tick pyaemia in the field was observed to be among lambs 3-8 weeks old the majority of naturally occurring cases were infected before the lambs were capable of reacting to toxoid. F. concludes that staphylococcal toxoid administered either to lambs or to ewes prior to lambing is of no value in preventing tick pyaemia.—J. I. TAYLOR.

PLASTRIDGE, W. N., & HALE, H. H. (1948.)
Mastitis control in Connecticut.—*Cornell Vet.*

38. 285-306. [Authors' conclusions copied
verbatim.] 1419

Observations on 658 herds show that *Str. agalactiae* mastitis is a specific contagious disease and should be handled as such. The disease cannot be eradicated by management alone nor by treatment of clinical cases as they appear. Mastitis due to other causes is less serious, in the cattle population as a whole, and its control depends primarily on the use of good milking practices, providing clean, well-bedded stalls of proper size, and not overfeeding with protein concentrates. It is possible to establish and maintain herds free from *Str. agalactiae* and in so doing to increase the quantity and quality of milk from a given herd of cows.

The requirements for an efficient program to control *Str. agalactiae* mastitis are: (a.) Periodic collection and laboratory testing of milk samples from all milking cows in the herd. (b.) Systematic treatment of all infected quarters in the herd. (c.) A barn program based on good sanitation, good management, and disposal or segregation of infected cows that remain infected after treatment.

Requirements for the effective use of penicillin in eradicating infection are: (a.) Cull infected cows that are low producers or have badly indurated udders. (b.) Detect all *Str. agalactiae*-infected quarters in the herd by laboratory tests on quarter samples. (c.) Treat all infected quarters with a series of three daily infusions of penicillin—200,000, 100,000, and 100,000 units, respectively, for cows with large udders and 100,000, 50,000, and 50,000 units for cows with small to moderate-sized udders. All quarters of cows infected with *Str. agalactiae* at the time of drying off should be infused with 100,000 to 200,000 units of penicillin during the period from two weeks after the last milking to three weeks before parturition. (d.) Retest in five to ten days and re-treat, dispose of, or segregate all cows remaining infected. (e.) Secure co-operation of the owner in carrying out measures to prevent spread of infection.

SLANETZ, L. W., & ALLEN, F. E. (1947.) **Penicillin therapy in streptococcal mastitis.**—*J. Amer. vet. med. Ass.* **111.** 125-127. 1420

In 243 cows 495 quarters were treated with penicillin by intramammary infusion, in doses ranging from 20,000-400,000 units in 100 ml. of distilled water. In cases of streptococcal mastitis one infusion of 100,000 units of penicillin was required in mild chronic cases, and larger doses or several infusions of from 20,000-100,000 units were required in acute or long-standing chronic cases.

It was found that in cases of acute or chronic mastitis one infusion of 400,000 units gave very good results. Eight cows with 14 infected quarters were treated with one infusion of 200,000 units of penicillin and 10 g. of sulphamethazine in 100 ml. of water. All quarters were cured. The authors recommend a further study on the use of these two agents together in the treatment of bovine mastitis.—CLIVE BRIGGS.

GORET, P., COLLET, P., JOUBERT, L., & COUROUBLE, G. (1948.) Deux cas de charbon bactérien chez la vache traités et guéris par la pénicilline. [Two cases of anthrax in cattle treated with penicillin.]—*Bull. Soc. Sci. vét. Lyon.* **50.** 36-41. 1421

A subacute case of anthrax was cured by the administration of 2,500,000 units of penicillin over a period of 24 hours. Similarly an acute case was cured with 3,000,000 units given over the same period. The authors favour a massive primary dose, 300,000 units intravenously and 400,000 units intramuscularly, followed by regular dosage at about three-hourly intervals.—G. V. L.

PÉLISSIER, A. (1948.) Sur une épidémie de charbon humain en basse Casamance. [An epidemic of human anthrax in Basse Casamance.]—*Bull. Soc. Path. exot.* **41.** 448-450. 1422

An outbreak of anthrax in Africans, suspected to have resulted from the consumption of meat of animals which had died from the disease.—E. G.

BOUVIER, G. (1946.) Recherche du bacille tuberculeux dans le mucus trachéo-bronchique du bovin. [Examination of the tracheo-bronchial mucus of cattle for tubercle bacilli.]—*Schweiz. Arch. Tierheilk.* **88.** 147-150. [In French.] 1423

In two series of tests on samples of tracheo-bronchial mucus from 500 and 100 cattle respectively suspected of being tuberculous, g. pig inoculations (one with each sample) were carried out, a sulphonamide being given to control infection by common contaminating organisms. Results of the tests were as follows:—

Of the 500 g. pig inoculations with simul-

taneous injection of cibazol (sulphathiazole) 124 yielded positive results (*i.e.*, 24.8%) and 19 died of intercurrent infections. Of the 100 g. pig inoculations with simultaneous injection of irgamid (the N₁-dimethylacroyl derivative of sulphanilamide) 30 yielded positive results and three died of intercurrent infections.

Of 100 other g. pigs inoculated with similar material, but without simultaneous injection of a sulphonamide, 13 died before diagnosis could be made. Sputa from these 13 animals were re-inoculated into g. pigs with simultaneous injection of cibazol and four were positive and eight negative.—E. KLIENEBERGER-NOBEL.

DAVIS, B. D., & DUBOS, R. J. (1948.) **The inhibitory effect of lipase on bacterial growth in media containing fatty acid esters.**—*J. Bact.* **55.** 11-23. 1424

In order to initiate growth from small inocula of tubercle bacilli in a liquid medium containing "tween 80" (a surface active agent), bovine serum albumin was incorporated in Dubos' medium. It was observed, however, that this renders the medium unstable. The albumin contained small amounts of lipase which, during two weeks of incubation, released more fatty acids from the "tween 80" than could be bound by the albumin. Thus the medium became bacteriostatic. The lipase effect can be eliminated in three ways (a) by destruction of the lipase through heating at 56°C., (b) by the inhibition of the lipase by fluoride in an amount not bacteriostatic to the tubercle bacillus, (c) by the use of crystalline bovine serum albumin not contaminated with lipase. When the lipase is thus eliminated from the medium it is possible to initiate growth with only two organisms. Lipolytic activity also accounts for the bacteriostatic effect of the same medium containing "tween 80" when a culture filtrate of *Mycobacterium phlei* is added. The authors point out the importance of guarding against lipolytic effects when materials of biological origin (blood, for example) are incorporated into a "tween 80" medium.

The use of "tween 80" and tubercle bacilli provides a very sensitive method for assaying lipase.—E. KLIENEBERGER-NOBEL.

RAZZA, F. (1949.) L'infezione tubercolare bovina in rapporto alle reazioni allergiche prodotte dalle tubercoline P.P.D. Weybridge, tipo mammifero ed aviario inoculate contemporaneamente per via intradermica. [The intradermal tuberculin test in mammals and fowls.]—*Riv. Med. Vet. Zootec.* **1.** 44-53. [English, French & Italian summaries. Abst. from English summary.] 1425

Cattle infected with tuberculosis gave good

reactions to the intradermal test with mammalian type P.P.D. tuberculin prepared by the Veterinary Laboratory, Ministry of Agriculture, Weybridge, England, and cattle infected with Johne's disease gave good reactions to intradermal tests with P.P.D. tuberculin prepared at that laboratory with avian type tubercle bacilli. By simultaneous tests with these two types of tuberculin, infection caused by mammalian type tubercle bacilli and infection with Johne's disease could be differentiated.

FURCOLOW, M. L., EMGE, M. E., & BUNNELL, I. L. (1948.) **Depression of tuberculin and histoplasmin sensitivity associated with critical illness.**—*Publ. Hlth. Rep., Wash.* 63. 1290-1298. [Authors' conclusions copied *verbatim*.] 1426

Critical illness exerts a depressing effect on skin sensitivity to tuberculin and to histoplasmin. The depressing effect of critical illness on skin sensitivity becomes more marked with advancing age. Patients with a fatal illness, particularly those who are within a few days of death, exhibit the lowest rate of skin sensitivity. Almost half (40 percent) of those insensitive when critically ill, reacted positively to skin tests again after they began to improve.

The evidence suggests that the depression is nonspecific with respect to the antigens used and to the cause of illness. These results call into question the value of any type of skin tests on persons critically ill from any cause.

FREEDLANDER, B. L., & FRENCH, F. A. (1947.) **Constitution of chemotherapeutic agents in experimental tuberculosis.**—*Amer. Rev. Tuberc.* 56. 373-375. 1427

The authors briefly discuss the development of the search for efficacious drugs including Ehrlich's contributions, and in the period 1920-35 the use of drugs containing the heavy metals, arsenic, the chaulmoogrates and many dyes.

With the sulphonamides (1935) came the introduction of the concept of therapeutic agents acting through competition for essential metabolites. In this connexion the main contribution of the sulphones to chemotherapy was that such non-acid-dissociating compounds permeated the tubercle bacillus more readily than the acid-dissociating sulphonamides.

Of the hundreds of antibiotics prepared several have been reported to have some effect on experimental TB. and critical animal therapeutic tests have been made with streptomycin.

New synthetic chemicals, e.g., *p*-aminosalicylic acid; 5-amino-2-butoxypyridine and others have been used in experimental TB. in recent years.

The chemical structure of essential metabolites, vitamins and antibiotics can be deliberately altered, e.g., the chemical structure of streptomycin may be slightly modified to form dihydrostreptomycin which is more stable than streptomycin.—E. M. J.

RIVIÈRE, C., THELY, M., & GAUTRON, G. (1947.) **Action accélératrice exercée, en de certaines conditions, par la pénicilline sur l'évolution de la tuberculose expérimentale du cobaye. [Accelerating action of penicillin, in certain conditions, on the course of experimental tuberculosis in g. pigs.]**—*C.R. Acad. Sci., Paris.* 224. 1856-1857. 1428

Following the observation that penicillin in very strong concentration had an inhibitory effect on *Mycobact. tuberculosis in vitro* its action *in vivo* was tested on g. pigs. G. pigs were infected by subcutaneous injection of 0.002 mg. of a virulent bovine organism and were treated with varying doses of penicillin either on the same day or up to seven days after infection. G. pigs which received doses of penicillin exceeding 10 units per g. bodyweight all died between the 10th-25th days of treatment, while the controls lived at least 50 days. Non-infected g. pigs receiving similar doses of penicillin also died between the 10th-25th days.—M. C.

HAUDUROY, P., & ROSSET, W. (1948.) **A propos de l'action accélératrice de la pénicilline sur la tuberculose expérimentale du cobaye. [Accelerating action of penicillin on experimental tuberculosis in the g. pig.]**—*Ann. Inst. Pasteur.* 75. 67-69. 1429

The authors attempted to confirm the findings of RIVIÈRE *et al.* (1947) [see preceding abst.]. They found that early death of g. pigs which had been infected with TB. and then treated with penicillin resulted from a toxic action of the penicillin and was not due to an acceleration of the tuberculous infection. They concluded that penicillin had no action on the evolution of TB. in g. pigs and that in a dose of 20 units per g. bodyweight injected daily under the skin it is very toxic for g. pigs.—M. C.

ANON. (1948.) **Specific laboratory tests in streptomycin therapy of tuberculosis. Report by the Pathological Subcommittee of the Streptomycin in Tuberculosis Trials Committee, Medical Research Council.**—*Lancet.* 255. 862-865. 1430

The streptomycin sensitivity of strains of *Mycobacterium tuberculosis* recovered from untreated patients was tested in a "tween 80" medium to which albumin had been added. It was compared with the sensitivity of a standard strain. Altogether 520 cultures of tubercle bacilli

from 18 centres were tested for streptomycin sensitivity and no cultures were more than four times less sensitive or four times more sensitive than the standard strain. During the streptomycin treatment of the patients cultures were taken at regular intervals for a resistance test. There was on the whole a good agreement in the tests carried out in different laboratories, but with a few strains a wide divergence in readings was obtained. This can be explained by the sudden onset of resistance in a culture.

The assay of streptomycin in the blood serum was carried out by a capillary tube method. A strain of Friedlander's bacillus was used as a test organism. The sera were tested one, three and six hours after the injections. Assays were also carried out in samples of urine and cerebrospinal fluid. The value of the methods adopted is discussed.—E. KLIENEGER-NOBEL.

BØE, J., & VOGELSANG, T. M. (1946.) **The sensitivity of BCG to streptomycin.**—*Acta tuberc. scand.* 20. 158–163. [In English, authors' summary copied *verbatim*.] 1431

The effect of streptomycin on the BCG strain has been investigated *in vitro*.

With a streptomycin concentration of 2 u/ml. there was a marked bacteriostatic effect, and at 10 u/ml. there was no growth on Sauton fluid.

Even after 17 days' incubation there were live bacteria in the cultures where the concentration was 20 u/ml.

The bactericidal effect was markedly less pronounced on resting cells than cells undergoing growth. A streptomycin concentration of 100 u/ml. was able to reduce only slightly the number of live cells in a BCG suspension in the course of 20 hours.

CURY, R., & PENHA, A. M. (1948.) **Observações sobre a infecção por bacilo de Preisz-Nocard no Estado de São Paulo.** [*Corynebacterium ovis* infections in São Paulo.]—*Bol. Soc. paul. Med. vet.* 8. 43–52. [Abst. from English summary.] 1432

The authors describe seven cases of *Corynebact. ovis* infection observed for the first time in the State of São Paulo in horses and mules. The symptoms differed from those generally described. The disease took the form of a purulent adenitis. In four cases the left pre-scapular lymph node was affected; in one the right pre-scapular, in another the left pre-pectoral and in the seventh case the right pre-pectoral lymph node. Only one lymph node was affected in each animal.

All the cases improved under treatment. Sulphanilamide treatment was apparently successful.

ILUKEWITSCH, A. (1948.) Ein neuer, dem

Diphtheriebakterium verwandter Erreger aus Niereneiter bei Serumpferden. [**A new *Corynebacterium* isolated from pus from serum horses with nephritis.**]—*Tierärztl. Umsch.* 3. 135–138. 1433

From kidney abscesses in serum horses an organism belonging to the genus *Corynebacterium* was repeatedly isolated. This organism produces a true soluble toxin which, unlike the diphtheria toxin, does very little damage to the adrenals and fails to lead to exudation into the peritoneal and pleural cavities. In experimentally infected g. pigs abscesses developed at the site of injection and sometimes in the kidneys. The organism is pathogenic for g. pigs, pigeons, rats, mice, cats and horses, and only slightly so for rabbits and dogs. It grows anaerobically as well as aerobically, and ferments glucose. Partial cross-immunization with diphtheria toxin is possible. The organism differs in various respects from *Corynebact. ovis*, *C. equi* and *B. equirulis*.—A. MAYR-HARTING.

NIZNÁNSKY, F., & JELENÍKOVÁ, A. (1948.) **Sopl'avka koní na Slovensku v r. 1921–1947.** [**Glanders in Slovakia during 1921–1947.**]—*Čas. československ. Vet.* 3. 587–594. 1434

A statistical survey of glanders during the period 1921–47. During the years 1935–43 there were no cases of glanders, but after the war from 1945–47, 109 cases were recorded. In 1948 no new cases were noted.—E. G.

SCHELLNER, H., & SEYERL, F. (1949.) **Beiträge zum Rotlaufproblem.** [**Swine erysipelas.**]—*Tierärztl. Umsch.* 4. 29–33. 1435

The authors discuss the various methods of immunization against swine erysipelas and the superiority of adsorbate erysipelas vaccine.

The characters of 70 cultures were studied and broth with the addition of 10% horse serum and 2% liver extract, the final pH being 7.6–7.8, was found to be the most suitable medium. Pathogenicity was tested on pigs, using the percutaneous skin reaction, tests also being done on mice. The vaccine was tested before issue on mice and pigs. Agglutination tests on fowl blood erythrocytes were carried out and compared with results obtained with other swine erysipelas sera.—E. G.

DINTER, Z. (1948.) **Ueber den Haemagglutinationshemmungstest beim Rotlauf.** [**The haemagglutination inhibition test in swine erysipelas.**]—*Berl. Münch. tierärztl. Wschr.* No. 10. 113–114. 1436

It was found that one of three strains of *Erysipelothrix rhusiopathiae* agglutinated chicken erythrocytes in the same way as described for influenza virus. This agglutinating action was specifically inhibited by erysipelas immune sera,

and was not influenced by normal sera or by diphtheria immune sera.—A. MAYR-HARTING.

KOCMAN, J. (1948.) Použitelnost rychlé aglutinace kapkové při intravitální a postmortální diagnostice červeny vepřů. [The rapid plate agglutination test for the diagnosis of swine erysipelas during life or after death.]—*Čas. československ. Vet.* 3. 620–626. 1437

K. describes results with the rapid plate agglutination test for the diagnosis of swine erysipelas.

Out of 69 clinically and bacteriologically confirmed cases 44 tests were positive, ten doubtful and 15 negative. Out of 84 immunized pigs tested five days after vaccination, four were positive and two doubtful. The pigs were revaccinated after 13 days and further tests were made four days later; 22 were positive, 34 doubtful. Out of 50 healthy pigs 45 were negative, four doubtful and one positive. The pigs with doubtful and positive tests had been vaccinated previously. Out of 45 pigs infected with various other diseases (bronchopneumonia, gastro-enteritis, Teschen disease, etc.) 38 were negative and seven doubtful.—E. G.

SVINTSOV, P. M. (1940.) Perfecting and reducing cost of production of swine erysipelas formol vaccine.—*Veterinariya, Moscow.* No. 3. pp. 19–22. [Abst. from French summary.] 1438

S. found that formolized swine erysipelas vaccine would keep its activity for 10–12 months, tests of activity being done on pigeons. Some details are given of the medium used for cultures in the preparation of the vaccine. It was found that alternate freezing and thawing of the formol vaccine over a period of 20 days rendered it useless.—I. W. JENNINGS.

WHITTEN, L. K., HARBOUR, H. E., & ALLAN, W. S. (1948.) Cutaneous erysipelothrinx infection in sheep. An etiological factor in post-dipping lameness.—*Aust. vet. J.* 24. 157–163. 1439

A lameness of sheep has occurred widely in New Zealand in recent years. It was described previously [*V. B.* 19. 169.] as occurring after dipping in insecticidal washes containing either derris or benzene hexachloride. The authors describe a number of instances and give a detailed account of their investigations which showed that the lesions in the feet of sheep were caused by *Erysipelothrix rhusiopathiae*. A detailed histological description is included. The lesions were of an acute inflammatory nature affecting the skin, subcutaneous tissue and soft structures within the hoof, including the laminae over the wall, heel and sole. Transmission experiments and bacterial examination indicated that the condition was of an infective nature and eventually *E. rhusiopathiae* was isolated by excision, with aseptic

precautions, of deeper tissues from the inflamed areas for culturing.

Penicillin prevented development of lesions when given 1 hour, 21 and 27 hours after infection, but in longer standing cases in which the laminae had become involved and lameness had developed there was no rapid clinical improvement.

Lameness develops only if there are abrasions on the feet of sheep at the time of dipping. The abrasions may actually occur during the dipping process but may be present before sheep are brought in from pasture. It is thought that quite small abrasions, e.g., pricks from thistles, may be sufficient to permit entry of the causal organism from fouled dipping fluid.

The disease is considered to be essentially similar to "erysipeloid of Rosenbach," a local infection of the skin in human beings by the same organism. During the investigations lesions of this nature were seen on the hands of men who had been handling infective dipping fluid. Experiments showed that infected dip washes may be rendered innocuous by the addition of a solution of copper sulphate to give a concentration of 1:5,000 in the dipping bath and it is considered that the inclusion of suitable bacteriostatic substances in the concentrated dipping material as marketed should prevent infections of the nature described.—H. McL. GORDON.

SCHNEIDER, L. (1948.) Additional data to the etiology of pasteurellosis with special reference to different species of hosts.—*Acta vet. hung.* 1. 31–42. [In English.] 1440

It was found that 373 cultures of *Pasteurella* collected from various animals could be classified into eight groups on the basis of their ability to produce acid from arabinose, xylose and sorbite. During a period of two and a half years the cultures had maintained their biochemical characters, though losing their virulence.—D. LUKE.

CAMPBELL, D., CAMPBELL, R. S. F., & DROMEY L. (1949.) Pneumonia in sheep associated with infection by a *Pasteurella*-like organism.—*Vet. Rec.* 61. 64–65. 1441

An acute pneumonia is described in ram lambs shortly after being housed. Swabs taken from the throats of three clinically recovered lambs, from four others which were coughing and from six unaffected ewe lambs all yielded *Pasteurella* on culture. Sulphapyridine seemed to have some curative effect on three lambs treated. Detailed P.M. findings are given.

The housing of the sheep appears to have had some predisposing effect and there was evidence that some of the sheep may have been carriers of the organism.—D. LUKE.

DEVOLT, H. M. (1948.) Sulfathiazole as an aid

to the control of fowl cholera in chickens and turkeys.—*Amer. J. vet. Res.* 9. 215-219. 1442

In the course of laboratory experiments sulphathiazole was fed at levels of 0.5, 1 and 2% to chickens, beginning two days before intravenous inoculation with a lethal dose of *Pasteurella avi-septica*. All the levels of sulphathiazole had a marked effect in reducing the mortality (mortality in controls 86.3%, in treated birds 12.4%), but at the 2% level toxic effects appeared in laying birds in three or four days. Blood levels of the drug were determined, and an average of 1.65-4.67 mg. per 100 ml. of blood appeared to be effective against artificial infection. In naturally infected flocks losses ceased after the administration of 0.5%, but the disease recurred in a few individuals when treatment was discontinued.—M. R. O.

COSTA, G. A. (1948.) Contribuição ao diagnóstico da peste nos ratos. [Diagnosis of plague in rats.]—*Monografias do Serviço Nacional de Peste*. I. [Abst. in *Trop. Dis. Bull.* 45. 513-514. (1948), copied *verbatim*. Signed: W. F. HARVEY.] 1443

A monograph of 250 pages restricted to the diagnosis of plague in rats might be doubtfully regarded as a real work of reference. It may be stated, therefore, at the outset that the abundant information contained in it, after a full historical introduction of 50 pages, relates as much to bacteriology as to zoology. A full summary indicates how much is the author's own personal experience from the examination of 10,000 rats, by which only two were found to be infected with plague, in Rio de Janeiro, and how much is a penetrating analysis and test of claims made by other authors. A short set of conclusions is, itself, a summary, and the bibliography extends to 334 references, each of which is presented under full explanatory title. There are no illustrations and no graphs, but there are many full tables which are in many respects more useful than graphic presentations. We have now for some time been accustomed to very thorough deliverances on plague from America and owe a great deal of our knowledge of epizootic and enzootic plague to these. One might even, protestingly and without seriousness, speak of America as the "home" of plague, a mere counterblast to the description of India as the "home" of cholera. The fact that this work is written in Portuguese should not be a deterrent to its use by anyone who is well versed in the subject matter, for it is easy to read and is packed with information.

Some of the facts, or, as the case may be, conclusions, can be shortly set out:—The rats reached the laboratory in a varied condition, some 1,500 still alive, some recently dead and many in an advanced state of decomposition. Necropsies

were undertaken in those of the species *R. norvegicus*, *R. r. alexandrinus*, *R. r. rattus* and *M. musculus*. Fleas on these rodents belonged in greatest number, 593 out of 598, to the species *X. brasiliensis* and *X. cheopis*. Special attention was paid to the possibility of organismal non-plague infections, contaminating and epizootic, which can lead the field worker astray in the diagnosis of plague. Even *Trypanosoma lewisi* came in for attention, as might diseases like tularaemia and melioidosis. Contaminating organisms of coli-aerogenes, *Proteus* and *Salmonella* groups often give trouble morphologically. It is evident that the author separates the pasteurellas of the animal haemorrhagic septicaemias, which seem to be one for every animal (*ovis*, *bovis*, *suis*, *canis*, *caprae*, *cuniculi*, *gallinae* etc.) from *Pasteurella pestis*. The chief differentiation, however, that is obligatory in the rat is that of *P. pestis* from *P. pseudotuberculosis rodentium* and this receives full consideration.

Four methods are singled out for a presumptive test and these are designated, the classical method, the method of thermoprecipitation, that of bone marrow puncture and the flea examination. Full identification is supplementary to the presumptive test. The author maintains strongly the value of bone marrow examination in decomposed animals. A great many suggested culture media have been examined for their selective differentiation value and the characters of the plague bacillus which are stressed are: morphology; motility at 22°C. (Levinthal's method); fermentation of glucose, lactose and saccharose; the indole, methyl red and reductase tests and finally an inoculation, that is to say guinea-pig, test. Much valuable direction is given to the type of plague, acute and chronic, especially in the declining epizootic which may justly bear such names as mitigated, benign, resolving, residual and inapparent plague.

An index would add greatly to the value of this monograph as a reference work.

[It is rather surprising that in a great many extensive bibliographies, as this one is, there should be no reference to the Royal Indian Commission (1898-99) although we find references to German, Austrian, English and even Astrakan Commissions. In historical texts and in text books, too, the "Existence of an Endemic Focus of Plague in the Foothills of the Himalayas" is very little noticed although it was given a chapter in the Commission Report referred to, and by HANKIN (*Ann. Inst. Pasteur*, 1898, v. 12, 711). It existed before the arrival of plague at Bombay from Hong Kong and was said to be commonly preceded by a rat epizootic. Another constant omission, which is understandable considering

the local character of the publications, is reference to the basic investigations of Glen Liston on rat-flea transmission of plague, and to Ashburton Thomson's Report on the Second Outbreak of Plague in Sydney, 1902. They formed very important supplements to the work of Simond in Bombay and were milestones on our path of knowledge. Liston's first study of "Plague, Rats and Fleas" and the part the latter played in the transfer of plague from rats to man was communicated to the Bombay Medical and Physical Society in February 1903, and a second to the Bombay Natural History Society in April 1903.]

MACPHERSON, C. F. C. (1948.) **A method of typing *Haemophilus influenzae* by the precipitin reaction.**—*Canad. J. Res. Sec. E.* 26. 197–199. 1444

The antigen for this precipitin typing test is obtained by first suspending the bacterial culture in 90% phenol to destroy the specificity of the somatic antigens. The denatured proteins and type specific polysaccharide are then precipitated with alcohol and the carbohydrate extracted from the precipitate with saline. Portions of the saline extract are added to samples of the six type specific antisera. A positive reaction with this antigen is indicated by marked turbidity in the test tube within five minutes after mixing and denotes the extraction of at least 0.01 mg. of polysaccharide. At least one non-typeable variant of each of the six kinds of encapsulated influenza strains has been examined by this method. Only Type *b* variants gave a positive test for type specific carbohydrate. Twenty strains of non-encapsulated *H. influenzae* (ten isolated from normal throats and ten from cases of respiratory infections) were examined for type specific polysaccharide. All gave negative results.—J. L. B.

KVITTINGEN, J. (1949.) **Studies of the life-cycle of *Proteus hauseri*.**—*Acta path. microbiol. scand.* 26. 24–50. [In English. Author's summary copied *verbatim*.] 1445

Studies on pleomorphism and swarming in *Proteus* are reported. Evidence is presented that the microbe has a life cycle, and that variations in the morphology in the individual cells and of the colony correspond to definite phases in this life cycle.

The cells in old broth cultures are short and plump. After inoculation on an agar plate, a colony is formed in the course of an initial period, which the cells use to improve their general condition, increase their volume and produce intracellular granules, after which, division commences. When multiplication is well under way, new types of cells are produced—the so-called swimmers. These are long slender homogeneously stained

rods, which spread out and come to rest again in the zone around the colony. On soft media the number of swimmers is large and the zones wide.

Swimmers which have come to rest develop regularly spaced intracellular granules. Division of the swimmers takes place through the middle of these granules, a number of short rods being formed. All short forms—except the end-pieces—have one granule at either end, which represents half of a granule from the mother cell (the swimmer). The end-pieces contain half a granule only. The short forms divide in the usual manner, and eventually produce new swimmers.

The intracellular granules give a positive Feulgen nuclear reaction and must be assumed to contain desoxyribonucleic acid. It must be assumed that they represent the nucleus of the microbe. It is suggested that the swimmers may be related to the above-mentioned end-pieces.

ROLLE, M. (1947.) Zur Diagnose der Infektion der Pferde mit *Bact. abortus equi*. [**Diagnosis of *Salmonella abortus-equi* infection in horses.**]—*Berl. Münch. tierärztl. Wschr.* No. 4. pp. 37–43. 1446

Although the various strains did not differ much in agglutinability, R. preferred an antigen from a mixture of strains. There was a definite optimum of turbidity of the bacterial suspension. Heated bacterial suspensions were unsatisfactory, even as O-antigens. R. used a mixed antigen consisting of equal parts of a formalin-treated and an alcohol-treated suspension; the formalin or alcohol being removed by centrifuging before mixing, and the bacteria being resuspended in 0.5% phenol in saline.

Comparing the results of bacteriological work on material collected P.M. with the results of the agglutination reactions carried out during life R. concluded that a weakly positive reaction at 1:400 is indicative of infection. In regions where many horses are affected a titre of 1:200 is positive. The reaction varies in the same animal with the same antigen and repeat tests are advisable.—A. MAYR-HARTING.

FRITZSCHE, K. (1948.) Die Bewertung der Agglutinationstiter bei der Paratyphus-abortus-equi-Infektion der Pferde. [**Agglutination titres in *Salmonella abortus-equi* infection in horses.**]—*Tierärztl. Umsch.* 3. 351–354. 1447

According to official instructions on the interpretation of the agglutination reaction for *S. abortus-equi*, only serum titres of 1:800 and above are to be regarded as positive. The author, on the basis of over 12 000 tests carried out with the sera of clinically healthy horses from which blood was taken for routine tests for glanders, concludes that titres much lower than 1:800

should be regarded as indicative of infection with *S. abortus-equi*. A fair number of healthy horses may have a titre of 1:100, but there are very few with a titre of 1:200, and this latter titre cannot be interpreted as due to a non-specific reaction. Before and a few days after abortion the reaction may be negative. A fortnight should elapse after abortion before taking blood for the test. Three hundred and thirty-four ponies coming from an environment entirely free from *S. abortus-equi* all had negative sera in dilution 1:50. The author believes that Sachweh's flocculation reaction is more suitable than either agglutination or complement fixation for distinguishing between normal and specific agglutinins.—A. MAYR-HARTING.

SLAWKOFF, D. (1948.) Ein Fall von *Salmonella rostock* beim Schwein. [A case of *S. rostock* infection in swine.].—*Wien. tierärztl. Mschr.* 35. 435-437. 1448

S. enteritidis var. *rostock* was isolated from muscles, kidney and lymph nodes of a slaughtered pig.—A. MAYR-HARTING.

MORRIS, J. A., & COBURN, D. R. (1948.) The isolation of *Salmonella typhi-murium* from ferrets.—*J. Bact.* 55. 419-420. [Authors' summary copied verbatim.] 1449

The isolation of *Salmonella typhi-murium* from ferrets is recorded. The symptoms and pathologic findings associated with paratyphoid infection are given, and the isolated organism is described. So far as we are aware no *Salmonella* has previously been described from ferrets.

FORSBECK, F. C. (1949.) "Infection unit" and "index of aggregation." Suggested epidemiological terms.—*Publ. Hlth Rep., Wash.* 64. 343-347. [Author's summary copied verbatim.] 1450

The term "infection unit" is submitted as a useful epidemiological term to define any isolated case [of typhoid] and any group of two or more associated cases, regardless of the manner in which they are associated.

The term "index of aggregation" is submitted as a useful epidemiological term to define the relationship of the number of cases to the number of infection units.

SOLOWEY, M., MCFARLANE, V. H., SPAULDING, E. H., & CHERMERDA, C. (1947.) Microbiology of spray-dried whole egg. II. Incidence and types of *Salmonella*.—*Amer. J. publ. Hlth.* 37. 971-982. 1451

Five thousand one hundred and ninety-eight samples of spray-dried egg powder obtained from 100 dehydration plants were examined for organisms of the *Salmonella* group; 35% of the samples were found to be contaminated, and 52 *Salmonella* types were identified. The types with

the highest incidence were those most frequently found in poultry.—A. MAYR-HARTING.

GAUGER, H. C. (1947.) Comparison of the rapid whole-blood K-antigen and the tube agglutination test for the detection of pullorum disease in turkeys.—*Poult. Sci.* 26. 229-233. 1452

A high correlation was found to exist between the tube agglutination test with serum and the rapid whole-blood K-antigen tests in turkeys naturally or artificially infected with *S. pullorum*. —A. MAYR-HARTING.

SEVAG, M. G., & MILLER, R. E. (1948.) Studies on the effect of immune reactions on the metabolism of bacteria. I. Methods and results with *Eberthella typhosa*.—*J. Bact.* 55. 381-392. [Authors' summary copied verbatim.] 1453

The effect of homologous immune serum with and without complement on the oxygen consumption by *Eberthella typhosa* (strains O-901 and H-901) and pneumococcus has been studied. A method has been worked out that makes it possible to calculate Q_{O_2} values (mm^3O_2 per mg. bacteria per hour) for intact, agglutinated, and lysed fractions of bacteria. The values thus obtained make it possible to evaluate the effect of various agents on the oxygen consumption of bacteria under the influence of immune and other factors.

Agglutinated *E. typhosa* (and pneumococci) consume volumes of oxygen equal to those of the respective controls. Intact sensitized cells with or without complement do not experience loss of oxidative activity, indicating that the formation of agglutinated clumps of bacteria does not involve physical or immunological barriers to the activity of oxidative enzymes. Sensitized *E. typhosa* (O-901) cells acted upon by complement undergo lysis. Immediately after lysis considerably more oxygen is used than by the controls containing the intact cells. Subsequently, the oxygen consumption of the lysed system undergoes up to 88% reduction. In simultaneous tests, oxygen consumption in the presence of yeast extract and glucose is greater than in the presence of glucose alone. In the presence of yeast extract, the reduction in oxygen uptake following lysis is likewise greater. In the presence of glycerol the oxygen consumption is also markedly greater than in glucose alone. The reduction in oxygen uptake by the glycerol-containing system is likewise much greater and more prompt than in glucose alone.

Whether or not the previously mentioned reduction in oxygen uptake by the lysed fractions of bacilli obtained by the action of complement on sensitized cells is due to the deterioration of liberated enzyme systems or to an inhibitory effect

of a specific combination between liberated intact oxidative respiratory enzymes and homologous antibodies cannot at present be answered. Further work pertaining to this question is in progress.

REWELL, R. E. (1949.) **Outbreak of *Shigella schmitzii* infection in men and apes.**—*Lancet*. 256. 220–221. [Author's summary copied verbatim.] 1454

Enteritis due to *Sh. schmitzii* broke out in apes and in men in close contact with them. The organism appears to have been introduced by a carrier, a lar gibbon. It caused the death of a chimpanzee, a severe attack of dysentery in one man, and transitory diarrhoea in another.

EWING, W. H. (1948.) **Interrelationships within the enterobacteriaceae.** pp. 66. Thesis, Cornell. 1455

The author undertook studies of *Shigella* bacteria, working out their antigenic structures, their relationships and other characters. He discussed interrelationships between members of the various genera of the Enterobacteriaceae.

—H. L. GILMAN.

BRAZIL, N. P., & TORTORA, L. (1947.) **Valor relativo de algunos metodos de diagnostico biologico en brucelosis animal. [Relative value of several biological methods of diagnosis of brucellosis in animals.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 57–59. [Abst. from summary.] 1456

A herd of 42 cows was tested for brucellosis by four methods with the following results:—

Fifty-five per cent. of the cows reacted positively to the serum agglutination test; 36% to the ring test; 24% to the skin test, using a brucellin prepared according to Burnet's method; and 17% to the whey agglutination test.—M. C.

SZYFRES, B., STELLA, J., ABARACON, D., & GIACOMETTI, H. F. (1947.) **Curva de aglutinacion en bovinos vacunados con cepa 19. [The agglutination titre in cattle vaccinated with strain 19.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 74–77. [Abst. from summary.] 1457

The agglutinins developed in the blood as a result of vaccination of calves with strain 19 disappear rapidly and in 90% of cases have disappeared within two years.—M. C.

BRAZIL, N. P., SZYFRES, B., TRENCHI, H., & ABARACON, D. (1947.) **Le prueba de la opsonocitofagia en la brucelosis por el metodo de Jersild. [The opsonic index test in brucellosis by Jersild's method.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 78–81. [Abst. from summary.] 1458

Jersild's method [*V.B.* 11. 876] was used with 200 samples of bovine serum. In samples

from cattle which were negative to the agglutination test little or no phagocytosis was observed. Cattle which had a high agglutination titre or which had a history of infection had generally a high opsonic index.

A group of animals which had been vaccinated 22 months previously with strain 19 and which were negative to the agglutination test had low opsonic indexes.

In cattle which had recently aborted the opsonic index was low and the agglutination titre high.—M. C.

DA SILVA, N. N. (1947.) **Brucelose: O problema humano e veterinario do rio grande do sul (Brasil). [Brucellosis in man and animals in Brazil.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 86–100. [Abst. from summary.] 1459

4.2% of 15,451 pure-bred cattle, 17.5% of 2,701 calves, and 21.7% of 3,400 dairy cows reacted to the test. In pigs there were 29.4% reactors in 207 which were tested. In man 0.57% of samples of blood sent for the Widal test were positive in titre higher than 1:100 for brucella. Among 107 employees of frigorificos there were 19.6% reactors.—M. C.

SALINAS, J. C. M. (1947.) **Indice de infeccion brucelosa en la especie canina de la ciudad de La Plata y sus alrededores. [Brucella infection in dogs in La Plata.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 101–105. [Abst. from author's conclusions.] 1460

There were no reactors among 325 dogs which were examined.

BRAZIL, N. P., & GARRIDO, V. (1947.) **Vacunoterapia endovenosa experimental. [Experimental intravenous vaccination in brucellosis.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 142–145. [Abst. from authors' conclusions.] 1461

Intravenous vaccination of recently infected animals causes a reaction at the site of injection.

From the variable results obtained in these experiments intravenous vaccination cannot be recommended.—M. C.

JURADO, F. R., & MORAN, B. L. (1947.) **Observaciones sobre permanencia de aglutininas postvacunales en terneras inmunizadas con brucella abortus cepa 19. [The persistence of agglutinins following calfhood vaccination with strain 19.]**—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 154–175. [Abst. from authors' conclusions.] 1462

In agglutination tests on 390 heifers which had been immunized with strain 19 it was found that 93.5% became negative within a year of their being vaccinated. From 4–9% of these became positive again between the 12th and 20th month after vaccination. A titre of 1:100 or more per-

sisting 12 months after vaccination is probably the result of infection.—M. C.

ROSEBUSCH, C. T. (1947.) Prevencion de la brucelosis por medio de una vacuna a base de cepas atenuadas no aglutinogenas (cepas MBB.). [A vaccine made from non-agglutininogenic strains (Strain MBB.).]—*Proc. 1st Nat. Congr. on Brucellosis*. pp. 218–237. [Abst. from author's conclusions.] 1463

Strain MBB. has been used to vaccinate 1,250,000 cattle.

Its characteristics and the results obtained are described. It is stated to be completely avirulent, it does not cause infection of the udder and is not excreted in the milk. It may be used on pregnant cows with safety. When used to vaccinate infected cattle it reduces the incidence of abortions.—M. C.

THOMSEN, A. (1948.) Om Forekomst af Brucella-Normalagglutinin i Kvaegserum Materiale fra Grønland. [The occurrence of brucella normal agglutinins in bovine serum from Greenland.]—*Maanedsskr. Dyrlaeg.* 59. 233–243. [English summary.] 1464

In Denmark dilutions of 1:20 up to 1:200 have been used in the routine agglutination test of *Br. abortus* infection in cattle. Requests have been received by the author's laboratory for the inclusion also of a tube at 1:10. To test the value of using a 1:10 dilution tests were carried out on cattle in an area of Greenland where the infection is absent. Very few reactions occurred, and none of them would have been regarded as positive in the routine test using the customary dilutions. Agglutination reactions at 1:10 were regarded as the indication that normal agglutinins were present. Such normal agglutinins were found to be almost constantly present in the Greenland cattle, but rarely in calves.—J. T. G.

RODWELL, A. W. (1948.) Observations on various factors influencing the viability of *Brucella abortus* strain 19 vaccine.—*Aust. vet. j.* 24. 133–143. 1465

Results of this series of investigations indicated that the viability of *Br. abortus* strain 19 suspended in buffered saline could be maintained at a satisfactory level (8×10^9 viable cells per ml.) for three months if stored at 4°C. Viability was adversely affected by longer storage, by rubber—particularly by acid washed rubber—, by a decrease in pH (optimum 6.3) and by increased temperature. The substrain used in the preparation of the vaccine was also found to be important. Fresh cultures received from the U.S. Bureau of Animal Industry had a high initial viable count which was maintained during storage.—N. W.

BEVERE, L. (1946.) Brucella—*Br. melitensis*—la reazione di Wright nei bufali del tavoliere.

[The agglutination test for the diagnosis of brucella infection in buffaloes.]—*Acta med. ital. Mal. infett. parasit.* 1. 169. [Abst. from abst. in *G. Batt. Immun.* 36. 271–272. (1947.)] 1466

B. reports on agglutination tests for the diagnosis of *Br. melitensis* and *Br. abortus* infections in buffaloes in the Puglia district of Italy. Seven out of 30 buffaloes yielded positive reactions.—E. G.

HOWE, C., MILLER, E. S., KELLY, E. H., BOOK-WALTER, H. L., & ELLINGSON, H. V. (1947.) Acute brucellosis among laboratory workers.—*New Engl. j. Med.* 236. 741–747. [Abst. in *Bull. Hyg., Lond.* 22. 568, copied *verbatim*. Signed: B. MOORE.] 1467

This paper is a clinical report on 17 cases of *Brucella* infection in laboratory workers handling *Br. melitensis* and *Br. suis* cultures at Camp Detrick, Maryland. All were young adults who had been previously inoculated with a *Brucella* vaccine. [No details of vaccination are given and there is no indication that the clinical course of infection was modified thereby.]

The clinical picture presented by nearly all the patients on admission was the characteristic one of pyrexia, lassitude and generalized pains, with virtually no localizing physical signs. Isolation of the specific organism from the blood of 15 patients showed that 8 were *Br. suis* infections and 7 *Br. melitensis*. There was no significant relation between the clinical course of the disease and the type of the infecting organism.

Eleven patients were treated with sulphadiazine, three with streptomycin, and two with combined penicillin and sulphadiazine. There was no evidence to suggest that chemotherapy had any beneficial effect.

Of 14 patients whose later history could be determined, ten had made a good recovery after illnesses lasting from one to twelve months; three still complained of occasional mild symptoms eighteen months after the initial attack; and one patient who had a *Br. suis* infection was still severely ill almost two years after her first symptoms and had had "more than ten" relapses in that time.

LEÓN, A. P., & SOSA, J. (1947.) Allergy in brucellosis.—*Amer. j. publ. Hlth* 37. 1033–1040. 1468

Rabbits and g. pigs were sensitized against brucella; the former with dead organisms and the latter with living suspensions. Skin tests were positive in both species, using formalin-killed saline suspensions of brucella at least one month after the sensitizing dose. Suspensions both of *Br. abortus* and of *Br. melitensis* were used

separately, and in the rabbit the reaction was stronger with the homologous antigen; the g. pig responded equally to the homologous and the heterologous antigens. Passive sensitization in the rabbits was demonstrated.

Human cases of brucellosis, and supposedly normal persons were subjected to skin testing with these suspensions in three strengths (10,000; 100,000 and one million organisms per ml.). Doses of 0.1 ml. of these strengths respectively gave 42, 89 and 100% positive reactions in cases of brucellosis, and 6, 8 and 26% positives among normal persons. The reaction was stronger with the homologous antigen in over 70% of cases. Allergy appeared one month after the onset of infection and thereafter increased.

In cases of six months' duration or more, almost complete desensitization to the skin test can be achieved in two to five months.—G. F. R.

JAREŠ-GOETZ, J. (1948.) Tularemie hlodavců ve vztahu k zdraví člověka. [Tularaemia in rodents in relation to human health.]—*Čas. československ. Vet.* 3. 397-398. 1469

A note dealing with generalities with no new information.

SCOTT, J. W., & MACBETH, R. A. L. (1946.) Tularaemia. (With a report of nine cases.)—*Canad. med. Ass. J.* 55. 564-566. 1470

A brief account is given of the aetiology, mode of infection, incidence, pathology, symptoms, complications, prognosis, diagnosis, prevention and treatment of tularaemia in man. Nine cases observed in Edmonton, Alberta, are described and mention is made of successful treatment with streptomycin.—J. F. A. SPRENT.

RAJAGOPALAN, V. R. (1947.) On the use of tissue-free media for the preparation of black-quarter vaccine: I. Cysteine hydrochloride broth: II. Acid digest of liver and meat.—*J. Path. Bact.* 59. 37-50. 1471

I. R. gives the protocols of his experiments on the production of a blackquarter vaccine from a cysteine medium. The lowest effective concentration of cysteine hydrochloride to support growth of *Clostridium chauvoei* was 0.05% and the growth was improved by the addition of 0.5% glucose. The optimum pH was 6.8 and sterilization by heat at 100-120°C. gave as good results as filtration. The medium should be used within 24 hours of preparation, but can be regenerated, by heating for half an hour at 120°C. just before use, for at least five days after preparation.

Anacultures of *Cl. chauvoei* are equally potent whether prepared from 12-hour, 48-hour or 14-day cultures; but 48-hour cultures are recommended. R. also advises a mixture of equal volumes of *Cl. chauvoei* and *Cl. septicum* anaculture

for the prevention of blackquarter in the field.

II. Experiments are described on the use of a medium prepared by acid digestion of liver and meat. *Cl. chauvoei* grows in a peptic but not in a tryptic digest of liver and an accident led to the discovery that it was the acid and not the pepsin that was responsible for the value of the peptic digest. The best results were obtained by digesting 1 kg. consisting of equal parts of liver and muscles mince, with 2 l. water and 80 ml. 10N HCl at 98°C. for five hours. After cooling overnight the pH was adjusted to 6.0 by the slow addition of 10N alkali. It was necessary to ensure, by shaking well, that the pH did not rise locally. The mixture was then steamed for ten min. and filtered through paper. Finally the pH of the clear filtrate was adjusted to 6.6-6.8 before the medium was distributed into flasks and sterilized for an hour. This medium can be regenerated by heat after storage for periods up to 15 days.

It was thought that the value of this medium in supporting growth might be due to the -SH groups in breakdown products resulting from digestion; but no such groups could be detected by the nitroprusside test. Reducing sugars were absent and ascorbic acid could not be demonstrated. After the addition of cysteine to the medium dichlorophenol-indophenol was reduced, indicating that ascorbic acid may have been formed from dehydroascorbic acid by cysteine.

Anaculture prepared from 48-hour cultures gave good results when tested as a vaccine.

—J. RICHARD HUDSON.

SCHOFIELD, F. W. (1948.) Acute pulmonary emphysema of cattle.—*J. Amer. vet. med. Ass.* 112. 254-259. 1472

This disease has been reported in Canada, the U.S.A., England, France and Holland. It is a disease of cattle at pasture and characterized by sudden onset and severe dyspnoea. No temperature reaction is seen. Barker, who knew the disease in England, had suggested to S. that the condition might be a form of hypersensitivity. S. discusses the various environmental and nutritional factors which he has found associated with his cases and he suggests that the essential aetiological factor is an enterotoxaemia, and while the exact pathogenesis is unknown, it is suggested that the toxins of *Clostridium welchii* play some causal part.

—D. LUKE.

BATTY, I., & GLENNY, A. T. (1948.) The antigenic efficiency of *Cl. welchii* epsilon toxin and toxoid after treatment with trypsin.—*Brit. J. exp. Path.* 29. 141-148. 1473

B. and G. immunized both rabbits and g. pigs with trypsinized toxoids of *Cl. welchii*, Type D, and with untreated toxoids. The treated toxoid

was found to be antigenically more efficient than the untreated, but there was no alteration in the combining power as shown by the Lf dose. The results when trypsin treatment was carried out prior to toxoiding were irregular and there was always a loss of combining power.

Trypsin treated aluminium precipitated toxoid when used for immunization of horses gave a better antigen than untreated toxoids. In hyperimmunization of horses the yield of antitoxin when trypsinized aluminium-precipitated toxin was used was almost double the yield obtained in good antibody producers with toxin not so treated, although in bad ones even trypsinized toxins did not improve the antitoxin yield.

The importance of the serum ratio (*in vivo* value: *in vitro* value of antitoxin) is stressed. It was found that horses giving a low serum ratio after one series of immunizations never produced high value antitoxin.—MARCUS S. BROOKE.

I & II. GUILLAUMIE, M. G., KREGUER, A., & FABRE, M. (1946.) Propriétés et composition de la toxine de *Welchia perfringens*. I.—Action hémolytique. [*Clostridium welchii* toxin. I. Haemolytic action.] II. Action léthale—effet nécrosant activité enzymatique. [II. Lethal action—enzymatic necrotizing activity.] —*Ann. Inst. Pasteur*. 72. 12–37; & 384–415. 1474

I. Titration of the haemolytic toxin of *Cl. welchii* is more satisfactory in a phosphate buffer solution of pH 6.6 than in saline. In an alkaline borate buffer the haemolytic power of the toxin is greatly reduced. At 37°C. it loses its haemolytic activity within a few days; the loss is more gradual at 2°C., particularly if the toxin is kept in a vacuum. The haemolytic power lost through storage can be restored by the addition of reducing agents like glutathione and cysteine, provided the storage has not been of long duration. Ascorbic acid lacks SH-groups but is a reducing agent, and it can restore the lost activity only to a very slight degree. Calcium salts are almost as active as cysteine in restoring the haemolytic titre, the chloride being more active than the acetate. All these agents have hardly any action on the fresh toxin.

Heating to 70°C. arrests the haemolytic activity and it cannot then be restored by reducing agents. If heated to 100°C. some haemolytic activity remains, and it can be further slightly raised by cysteine or calcium. Toxins which have become inactive through heating at 70°C. regain some of their haemolytic activity if subsequently heated to 100°C.

For toxins that were precipitated with ammonium sulphate and redissolved the above description holds good in every respect.

Antitoxic sera were prepared in horses and the best dose to begin the course of injections was found to be 500 M.L.D. as tested in mice. There was a marked discrepancy between the antihaemolytic activity of the sera *in vitro* and their anti-necrotizing and anti-lethal activity *in vivo*.

II. The specific constituents of the toxin are the lethal and necrotizing antigen α , the haemolysin θ , and a third antigen η , which contributes towards the lethal action of the toxin but is not necrotizing. Which toxins are produced depends largely on the medium. For instance, η is produced in a liver digest medium, but not in a medium containing cooked liver. In addition, some strains of *Cl. welchii* produce a non-specific "pseudotoxin" which kills mice and g. pigs instantaneously and is not neutralized by antiserum.

Like the haemolysin, the lethal and necrotizing components of the toxin are more severely damaged at 70°C. than at 100°C., and their toxicity lost at 70°C. can be partially restored by subsequent heating at 100°C. On the other hand, heating to 70°C. after first heating in the boiling waterbath further diminishes the activity but does not destroy it. The lethal and necrotizing activity lost through storage can to a certain extent be restored by heating to 100°C., but the effect of heat is far less clear-cut in stored than in fresh toxins. All three components, α , θ and η , if precipitated by ammonium sulphate, are destroyed if heated for 30–60 min. at 100°C. at pH 7.6. The toxin filtered through a Chamberland L₃ filter loses much of its toxicity. The loss is probably due to a loss of component η .

Various enzymes produced by *Cl. welchii* are also specifically inhibited by the antiserum. These are:—(1) a gelatinolytic enzyme the action of which is also completely arrested by heat at 70°C., but not completely by heat at 100°C., (2) a toxin that destroys specifically the blood group substances A and B, (3) hyaluronidase (diffusion factor), (4) lecithinase. There is a high but not a complete correlation between the content of the toxin in component α and in lecithinase. Heating to 100°C., although preserving some necrotizing activity, arrests the lecithinase, unless calcium is added; and heating to 100°C. after a prior heating to 70°C. does not restore the lecithinase activity.

—A. MAYR-HARTING.

LOGAN, M. A., TYTELL, A. A., DANIELSON, I. S., & GRINER, A. M. (1945.) Production of *Clostridium perfringens* alpha toxin.—*J. Immunol.* 51. 316–328. 1475

The production of *Cl. welchii* α -toxin is described. The cultures are maintained in a protein-free medium containing casein hydrolysate, dextrin, sodium succinate, extracted beef

heart, amino acids, and vitamins. Passage of the stock culture through pigeons is important in maintaining toxigenicity. The main medium includes a specially prepared pancreatic digest of beef, dextrin, vitamins, salts, and a measured quantity of iron. The best formula must be found by small trials prior to large-scale production. Certain strains of *Cl. welchii* (A) yield 800–1,000 LD₅₀ of α -toxin per ml., equivalent to 9–12 units per ml. Important factors are the pigeon-passage, the use of dextrin instead of glucose, the inclusion of fat extracted muscle or an enzymic digest, and the clearing of the culture by centrifuging instead of filtration through adsorbents.—J. KEEPIE.

BOTIJA, C. S. (1942.) Epizootologia del botulismo de los equidos en España. (Investigaciones sobre la contaminación de los alimentos.) [Equine botulism in Spain—food contamination.]—*Trab. Inst. Biol. anim., Madrid*. 7. 223–288. [French summary.] 1476

Botulism due to type C toxin is a fairly common disease of horses, mules and donkeys in Spain, occurring in the central and southern regions of the country where the subtropical conditions favour growth and toxin formation by *Cl. botulinum* in foodstuffs. The disease occurs sporadically and enzootically in hyperacute, acute, subacute and chronic forms. The vector appears to be the farmyard cat which, after eating putrefying organic matter containing *Cl. botulinum* toxin, deposits its faeces in grain and other feeding stuffs and in this manner passes the toxin on to the solipeds. The faeces of cats on infected premises have been shown by laboratory tests to contain large amounts of type C toxin. Faeces of cats from some areas in which there was no history of botulism did not contain any toxin. Grain contaminated in this way has been found on premises where botulism has occurred. Tests showed that the cat has a most remarkable resistance to *Cl. botulinum* toxin. The toxin seems to be partially fixed and retained by the cells of the intestinal mucosa, and to be passed out in gradually decreasing quantities during the 10–15 days following ingestion.

The method of dealing with an outbreak of botulism involves removal of all old food and the provision of new clean food, following cleaning and disinfection of the premises. *Cl. botulinum* type C antitoxin should be used prophylactically and curatively, but as it is not yet available commercially in Spain there are no reports on its use.

The author believes that "infectious paraplegia" of horses in France and Spain is a manifestation of botulism.

[The article contains much clinical and other

information that cannot be dealt with in a brief abstract.].—I. W. JENNINGS.

LAMANNA, C., & GLASSMAN, H. N. (1947.) The isolation of type B botulinum toxin.—*J. Bact.* 54. 575–584. [Authors' summary copied verbatim.] 1477

A method for the purification of the type B toxin from the proteolytic "okra" strain of *Clostridium botulinum* is described. Essentially the purification depends upon working with the toxin on the acid side of its isoelectric zone and upon a series of acid precipitations. The purified toxin appears to be a slightly colored, simple protein, soluble in water on the acid side of the isoelectric range and relatively insoluble on the alkaline side and within the isoelectric range. Slight additions of salt do not favor increased solubility of the purified toxin.

Serologically, chemically, and physically the purified B toxin differs from type A crystalline toxin. Its toxicity per milligram of nitrogen is only slightly less than that of the type A, but on a molar basis, it would appear to be 10 times less potent. By the intraperitoneal route the guinea pig is about three times more susceptible to the toxin than is the white mouse.

FORMAN, C. R. (1946.) Single injection specific treatment for foot rot in cattle.—*J. Amer. vet. med. Ass.* 109. 126–128. 1478

F. instances his own results in his own herd and those obtained by other practitioners, as showing that a single intravenous injection of 60 g. of sodium sulphapyridine is a successful and non-toxic treatment of both recent and long-standing cases of foot-rot in Jersey and Guernsey cattle aged from one and a half to ten years, and weighing 500–1,000 lb. A 12% solution of the drug in distilled water was satisfactory. There were few failures, although occasionally a second dose was needed 4–5 days after the first. The local lesion was left alone and the treated cow put back in the milking herd; the lesions disappeared in from a few days to two weeks. There were no ill effects in eight out of nine cows given doses of 90 g. of sodium sulphapyridine in 10% solution intravenously, apart from a slight nervous reaction following administration; in the ninth cow the ill effects lasted only a few hours.

—E. COTCHIN.

CANDLIN, F. T. (1947.) The use of sodium sulfamerazine in foot rot (infectious pododermatitis, interdigital phlegmon) in cattle.—*J. Amer. vet. med. Ass.* 111. 278–280. 1479

A single intravenous dose of sodium sulphapyridine [see preceding abst.] was an efficacious treatment, but when supplies of that drug became difficult to obtain, sulphamerazine was tried.

Of 34 cattle, 32 cows and one bull were successfully treated by a single intravenous dose of sodium sulphamerazine dissolved in 250 ml. normal saline, given as rapidly as a 16-gauge needle would allow. The optimum dose appeared to be 3 g. per 100 lb. body weight. After such a dose in the acute inflammatory stage of the disease, a decided improvement was noted within 48 hours. Further intravenous or oral doses would be valuable in cases with suppuration and necrosis of the deeper structures of the foot. No ill effects were noted during or following the intravenous injections.

—E. COTCHIN.

HALL, H. T. B. (1947.) **Ringworm of horses in Fiji.**—*Agric. J. Fiji*. 18. 11–18. 1480

Ringworm of cattle and horses assumed serious proportions in Fiji in 1944 and remained prevalent during 1945–46. Details are given of the methods adopted in the control of the disease, legislation being introduced in certain areas to control the movement of stock and fittings and to order organized musters and treatment. A lime-sulphur and, later, a coconut-oil and “dieselene” [composition not given] mixture were most commonly used for treatment. The disease was serious and required active measures for its suppression.—CLIVE BRIGGS.

HOLM, P. (1948.) **Some investigations into the penicillin sensitivity of human - pathogenic actinomycetes and some comments on penicillin treatment of actinomycosis.**—*Acta path. microbiol. scand.* 25. 376–404. [In English. Abst. from author's summary.] 1481

Thirty-one anaerobic actinomycetes pathogenic to human beings have been isolated from 27 patients, classified in species and examined for penicillin sensitivity.

When suspensions of the organisms were used they were of the same degree of sensitivity as staphylococci. When whole colonies were used, the strains fell into two groups, one with colonies more resistant than staphylococci and the other less so.

It is suggested that the resistance of the actinomycetes in the body is indicated by the resistance of the “sulphur granules” existing in the pus, and that this resistance is comparable with that found for whole colonies. It is suggested that this explains why some patients recover after comparatively short treatment with rather small doses of penicillin, whereas in other cases large doses given over a longer period are necessary.

Patients infected with an anaerobic *Actinomyces* in the internal organs should be treated with penicillin.

Infection with actinomycetes is often complicated by associating bacteria; the effect of

such bacteria on the penicillin treatment is discussed.

BENBROOK, E. A., BRYANT, J. B., & SAUNDERS, L. Z. (1948.) **A case of blastomycosis in the horse.**—*J. Amer. vet. med. Ass.* 112. 475–478. 1482

Suppuration accompanied by great swelling developed in the region of the anus and vulva of a mare. The animal continued to work for nine months while under treatment, but later became emaciated and weak and was destroyed. P.M. the lesion was found to be caused by *Blastomyces dermatitidis*.—MALCOLM WOODBINE.

PRCHAL, C. J. (1948.) **Coccidioidomycosis of cattle in Arizona.**—*J. Amer. vet. med. Ass.* 112. 461–465. 1483

During a ten-month period, in 1946–47, out of 38,175 cattle and 55 calves slaughtered, 503 cattle and eight calves were found in the course of meat inspection to be infected. None of these cases could have been detected by clinical *ante-mortem* inspection. The author refers to the use of serological tests. Evidence is given which indicates that infection is picked up in the fattening pens, where the cattle are placed for 60–90 days following the two-year pasturing on open ranges and in valleys, but whether by inhalation or by the digestive tract is debatable.

It is most common in two and a half to three years' old Hereford steers in good condition, usually involving the thoracic lymph nodes, but sometimes the mediastinal and bronchial lymph nodes as well.

In the typical lesion a thoracic lymph node is bulbous, and on incision circular areas can be seen which contain purulent centres, white or light cream in colour and thick and adhesive in character. The lesions may coalesce. Lesions also occur in the lungs, but the author hesitates to describe them at present.

The author considers that infection may occur in man and in animals by inhalation.—M. W.

BERNKOPF, H., STUCZYNSKI, L. A., GOTLIEB, T., & HALEVU, CH. (1948.) **Serological examination of human and cattle sera from Palestine for the presence of antibodies against a bovine strain of *Leptospira*.**—*Trans. R. Soc. trop. Med. Hyg.* 42. 259–265. 1484

Eight hundred and sixty-nine serum samples from animals slaughtered in Palestine were examined for the presence of bovine leptospiral agglutinins. A serum titre of 1:200 was considered significant and 9.5% of the animals examined gave positive reactions at this titre. The antigens used were (a) a bovine strain of *Leptospira* isolated in Palestine and said to be closely related to *L. grippotyphosa* and (b) the

Jackson strain of *L. icterohaemorrhagiae*. Higher titres were obtained with the bovine strain. In two cases the serum titre with the bovine antigen was 1:3,200 against 1:20 with *L. icterohaemorrhagiae*. Although concurrent infections with *L. icterohaemorrhagiae* were not ruled out it is suggested that the reactions obtained were coagglutination reactions.

In tests on the serum of 509 rats for bovine leptospiral agglutination none yielded a positive result.

In tests of the sera of 207 workers in abattoirs four gave positive reactions.—A. R. JENNINGS.

GUIDA, V. O. (1948.) Sobre a presença de leptospira em suínos no Brasil. [On the presence of leptospira in pigs in Brazil.]-*Arg. Inst. biol., S. Paulo*. 18. pp. 285-287. [Abst. from English summary.] 1485

Leptospira were cultivated from the kidneys of three out of 50 apparently normal pigs in São Paulo and were identical.

The leptospira were serologically distinct both from *L. canicola* and from one strain of *L. icterohaemorrhagiae*, isolated from *Rattus norvegicus* in São Paulo.

NIKOLAJEV, I. I. (1946.) Leptospirosis in the U.S.S.R.—*Med. Parasitol., Moscow*. 15. No. 4. 65-74. [Abst. in *Bull. Hyg., Lond.* 22. 697, copied *verbatim*. Signed: D. J. BAUER.] 1486

Four types of leptospirosis are known to occur in the U.S.S.R.

(1) The type due to *Leptospira grippotyphosa*. Mud Fever. This was first recognized in Moscow in 1927, and the causative organism was isolated in 1928 and differentiated from other types. In 1944 in Mogilev *Eutamias glareolus* [now known as *Clethrionomys glareolus*] [a small rodent] was found to be a vector, and the widespread occurrence of the disease is shown by the appearance of outbreaks in Smolensk, Odessa, Sverdlovsk, Rostov and other widely separated areas. This type also causes epizootics in cattle (in Ordzhonikidze, Voronezh, Rostov, Krasnodar, Ukraine, etc.).

(2) The type due to *L. icterohaemorrhagiae*. This was first seen in Kiev in 1928. In 1942 a considerable outbreak occurred in Leningrad, with some hundreds of cases [number not stated] in which the disease was spread by food.

(3) Far Eastern types A and B. In 1937, 6 strains of leptospira were isolated from six cases of an unknown disease in the Far East. They were distinct from other types; five were identical (type DV-B), the remaining one being distinct (type DV-A). Two strains of type DV-B were isolated from rats examined in Moscow in 1944, and this type has also been shown to cause epizootics in silver fox farms (1939 to 1943).

CADILLA, A., SANTOS, J. A., & LUGO, I. R. (1946.) Leptospirosis canicola en el sér humano. [Leptospirosis canicola in a human being.]-*Bol. Asoc. Med. P. Rico*. 33. 463-468. [Abst. in *Bull. Hyg., Lond.* 22. 252. (1947), copied *verbatim*. Signed: H. J. O'D. BURKE-GAFFNEY.] 1487

The following is a translation of the authors' summary.

This article deals with a case of *Leptospira canicola* infection in a human being, and is of interest for the following reasons:—1. It is the first case of this disease published in the Porto Rico medical literature. 2. Survey of the literature available to us up to now records only 28 cases in the world, and this is therefore the 29th. 3. It is the first time that the use of penicillin in this disease has been recorded, with excellent results, and this might draw the attention of others to this form of treatment of *canicola* infections in the future.

ROCH, R., & MACH, R. S. (1947.) La maladie des jeunes porchers (maladie de Bouchet-Gsell). [The disease of young swineherds.]-*Praxis*. 36. 1-7. [Abst. in *Bull. Hyg., Lond.* 22. 252-253. (1947), slightly modified. Signed: E. HINDLE.] 1488

The authors give a detailed summary of previous observations on this disease which was first noticed in Upper Savoy in 1914 but not recognized outside that area until 1932. They then give details of a typical case observed in Geneva, in which the patient was a young swineherd who had worked in a pig-farm for 3 months. His serum was tested for agglutination against seven strains of *Leptospira* on the 4th day of the disease when all tests were negative; on the 9th day when the serum agglutinated *L. sejro* and *L. pomona*, both in dilutions of 1:400; and on the 23rd day when the titre for *L. sejro* had increased to 1:2,000 and for *L. pomona* to 1:4,000, and in addition the serum agglutinated *L. grippotyphosa* 1:200, and *L. icterohaemorrhagiae* 1:100.

The authors examined the serum of the workers in 10 pig-farms in the neighbourhood of Geneva; all were negative except those from the workers at a farm at Perly, where the above case occurred. This is the most important pig-farm in the canton, with an average of 500 to 600 pigs. The head swine-herd suffered from the disease in 1928 and his blood still agglutinated *L. pomona* in dilutions of 1:200; another herdsman had been ill in 1930 and his blood was also positive in the same dilution; another, the patient described above, became ill 2 months after starting work at the farm, and the last seen became ill after only 5 weeks. The son of the owner, who occasionally worked on the farm, also became infected in 1946

and showed an agglutination of *L. pomona* at 1:100 dilution. The cantons of Vaud and Geneva were then investigated and gave the following results:—

Number of swine-herds examined	...	37
Agglutination positive against <i>L. pomona</i>	...	14
" " " <i>L. canicola</i>	...	2
" negative	...	21

Of the 14 positive against *L. pomona*, 12 had had symptoms of infection and 2 had none.

An examination of the blood of pigs at various farms gave somewhat curious results, as shown in the following table:—

Perly, Geneva (50 pigs) :-				
Agglutinations positive against <i>L.</i>				
<i>pomona</i> ... ..	...	...	...	23
Agglutinations stronger against <i>L.</i>				
<i>icterohaemorrhagiae</i> ... ..	...	...	...	12
Agglutinations negative	...	...	...	15

Loex, Geneva (2 pigs):—1 positive against *pomona* and 1 negative.

Bel-Air, Geneva (2 pigs):—both negative.

Villars-Bozon, Vaud (9 pigs):—7 positive against *pomona* and 2 negative.

Berikon, Argovie (8 pigs):—All negative against *pomona*, but 6 agglutinated *L. icterohaemorrhagiae*.

Mosnang, St. Gall (12 pigs):—All negative against *pomona* alone, but 10 positive against *L. icterohaemorrhagiae* to an equal or a higher titre than *pomona*.

It is difficult to explain the relation between these two strains of *Leptospira*, and especially the presence in some cases of agglutination against *L. icterohaemorrhagiae*, for no recognizable case of Weil's disease has ever been recorded in any of the swine-herds.

I. DE GAETANI, G. F. (1947.) Modificazioni nei batteri coltivati su agar-organici. Nota I: Consumo di O_2 dell'*Esch. coli* e dello *Staph. aureus*. [Modifications of bacteria cultivated on organic agar. I. O_2 consumption of *Bact. coli* and of *Staph. aureus*.]—*G. Batt. Immun.* 37. 8–18. [English, French and German summaries.] 1489

II & III. LENTI, G., & JANNELLA, L. (1947.) Modificazioni nei batteri coltivati su agar-organici. Nota II: Variazioni di alcune attività fermentative dello *Stafilococco aureo*. [Modifications of bacteria cultivated on organic agar. II. Variations in some fermentative actions of *Staph. aureus*.] Nota III: Variazioni del potere emolitico dello *Stafilococco aureo*. [III. Variations in the haemolytic power of *Staph. aureus*.]—*Ibid.* 19–30; & 31–37. [English, French and German summaries.] 1490

IV. LENTI, G. (1947.) Modificazioni nei

batteri coltivati su agar-organici. Nota IV: contegno della setticemia da *Stafilococco aureo* coltivato su agar fegato. [Modifications of bacteria cultivated on organic agar. IV. Development of septicaemia from *Staph. aureus* cultivated on liver agar.]—*Ibid.* 38–48. [English, French and German summaries.] 1491

V. LENTI, G., & ARRIGO, F. (1947.) Modificazioni nei batteri coltivati su agar-organici. Nota V: Agglutinabilità della *Brucella melitense*. [Modifications of bacteria cultivated on organic agar. V. Agglutinability of *Brucella melitensis*.]—*Ibid.* 255–262. [English, French and German summaries.] 1492

VI. JANNELLA, L. (1947.) Modificazioni nei batteri coltivati su agar "Organi". Nota VI: la morfologia e la Gram-resistenza dello *Stafilococco piogeno aureo*. [Modifications of bacteria cultivated on organic agar. VI. Morphology and Gram-resistance of *Staph. pyogenes aureus*.]—*Ibid.* 263–278. [English, French and German summaries.] 1493

Cultures of *Bact. coli* and *Staph. aureus* were subcultured at weekly intervals for 40 passages on special agar prepared with extracts of heart, liver and kidney respectively instead of beef. The authors describe certain metabolic changes that occurred in the adapted strains as compared with unadapted strains grown on ordinary nutrient agar.

I. The oxygen uptake, measured by Warburg's technique, using heart, liver and kidney broth as substrate, was not increased as a result of adaptation.

II. Adapted strains of *Staph. aureus* had greater fermentative power than unadapted strains, the increase being most marked in those grown on kidney agar. The tests used were power to ferment glucose and lactose, to clot milk, to liquefy gelatin and to reduce nitrate to nitrite.

III. The haemolytic power of *Staph. aureus* was tested with red cells from normal persons and from persons affected with various diseases. The adapted strains all had greater haemolytic activity than unadapted strains, the increase being most marked with those grown on liver agar and heart agar.

IV. Rats, mice and g. pigs were inoculated intravenously with broth cultures of adapted and unadapted strains of *Staph. aureus*. Twenty-four hours after inoculation the animals were killed, the heart blood was cultured on solid medium and the colonies which developed were counted. Impression cultures were made from lungs, liver, spleen, kidney and muscle. Those animals which had been inoculated with adapted strains yielded a greater number of colonies than the controls inoculated with unadapted strains. L. concluded

that the pathogenicity could be increased by growing the organisms on liver media.

V. The authors used strains of *Br. melitensis*, adapted to grow on organ agar (as in previous papers), in agglutination tests with sera of patients with brucellosis. The controls were unadapted strains of the same organism. In all cases higher titres were obtained with adapted strains than with the controls. The difference did not appear to be due to a change from smooth to rough forms of the organism.

VI. Using a standardized method of Gram staining, J. studied changes in morphology and staining of staphylococci adapted to growth on "organ" agar. In strains adapted to liver agar small cocci predominated and there was marked inequality in the size of individual cocci. Those grown on heart and kidney agar were more constant in size. The number of cocci in the clusters was greater when the cocci were small than when they were large. Strains adapted to growth on kidney agar were more resistant to decolorization than are those grown on liver agar. If the organisms were treated for some hours with fresh extracts of liver or kidney before staining they tended to be more easily decolorized, especially the strains adapted to liver agar.—S. T. C.

EPHRATI, E. (1948.) **The mechanism of the effect of X-rays on bacterial toxins.**—*Biochem. J.* 42. 383–389. 1494

Tetanus toxin and staphylococcal haemolysin are destroyed by X-rays. Impurities present with the toxin have a protective action against X-rays. Purified toxins were found to be protected by the addition of certain proteins and of those breakdown products of proteins that have a reducing action. Some reducing substances not connected with protein—thioglycollic acid and ascorbic acid—were also highly protective. Oxydizing substances were ineffective protective agents. It is

See also absts. 1601 (rumen bacteria); 1609 (of thrush in horses); 1618 (*Erysipelothrix* infection in dipped sheep); 1643 (meat inspection).

concluded that the X-rays produce oxydizing radicals which destroy the toxins. This action is countered by reducing agents. Although native proteins are not reducing, denaturation as caused by X-rays sets free reducing groups, and these are probably responsible for the protective action. The toxins have, after irradiation, lost the power to produce neutralizing antibodies.—A. M.-H.

PIJPER, A. (1947.) **Methylcellulose and bacterial motility.**—*J. Bact.* 53. 257–269. 1495

A further study by the author on the motility of bacteria and the role of "flagella". He maintains that the structures known as "flagella" have no active function as organs of motility, that bacteria move in undulating gyrating fashion, the polysaccharide outer covering of the cell wall being thereby passively twisted into a tail; this may untwist into a number of fine wavy threads. Motility is not dependent on the presence of flagella.

The observations are carried out in methocel (methylcellulose), which slows down motility, without, however, producing a voluminous precipitate of colloid material on the "flagella", as in the case of gelatin or gum. The results obtained with various methocel solutions are described in detail and there are some excellent photographs.

—A. MAYR-HARTING.

FAVOUR, C. B. (1948.) **Bacteriological study of carboxylmethoxylamine hemihydrochloride.**—*J. Bact.* 55. 1–9. 1496

Carboxylmethoxylamine hemihydrochloride, a metabolic inhibitor, is bacteriostatic in small concentrations, bactericidal in large. Although it is too toxic for use as a preservative used in large-volume, parenterally, it has special uses in which other substances are ineffective. Bacteriostatic concentrations do not inhibit the influenza virus, PR8 strain.—W. R. BETT.

DISEASES CAUSED BY PROTOZOAN PARASITES

ROBINSON, E. M. (1948.) **Notes on serological tests carried out on equine species infected with dourine.**—*Onderstepoort J. vet. Sci.* 23. 33–38. 1497

Dourine was found to be widespread in North Western Cape Province and adjoining parts of the Transvaal and Orange Free State. Between 1930 and 1940 an attempt was made to eradicate the disease, but was abandoned on account of lack of interest by the farmers; but some breeders continued to try to keep their farms free from the disease. In 1937 the disease was diagnosed in the Western Province where there are many progressive horse breeders. The whole equine

population was tested by the complement fixation test, some 20,000 tests being performed. The outbreak of war prevented extension of this work to other areas.

The exact distribution of the disease at present is not known. Of 3,000 horses purchased for the army during the war 31 reacted to the test, all the reactors being geldings presumably infected prior to castration or else infected as foals. A number of reactors were kept under observation for prolonged periods and the results of tests and re-tests of these are tabulated. One mare was observed for five years, during which its reaction to the test remained strong; it foaled several times

and was in good condition throughout the period. Many others remained in good condition and had no clinical signs of dourine.—M. C.

ROBINSON, E. M. (1948.) **Dourine infection in young equines.**—*Onderstepoort J. vet. Sci.* 23. 39–40. 1498

Foals born to infected mares react to the complement fixation test as soon as they have drunk colostrum and remain reactors for some months. The period during which they remain positive has been reported to vary from two to as long as 13 months. Six young mares aged from 9–15 months from an infected farm and which reacted positively to the complement fixation test were brought to the laboratory for study. It was assumed that because of their young age they had never been mated. At the laboratory they were kept isolated from all other horses until they reached sexual maturity, at which time they still had strong positive reactions. The six mares were then run with a healthy stallion which was observed to serve two of them.

One of the mares died and had cirrhosis of the liver, dilatation of the stomach and impaction of the colon with sand when examined P.M. One was destroyed on account of weakness and decubitus and on P.M. examination had changes due to cachexia. No trypanosomes were found in washings from the vagina and uterus, nor in the cerebrospinal fluid.

The stallion, which was completely negative to the c.f. test at the commencement of the experiment, gave a weakly positive reaction after six weeks. In subsequent tests over the next few months the reaction became strongly positive. *T. equiperdum* was demonstrated in small numbers in the blood on the date when the first positive reaction to the c.f. test was found.

It is concluded that foals may become infected before sexual maturity and such foals on reaching sexual maturity are capable of transmitting infection to a stallion during service.

—M. C.

AZEVEDO DE, J. F., TEIXEIRA, A. W. G., & COITO, A. DE M. F. (1947.) Sobre a infestação por leishmanias nos cães de Lisboa. [*Leishmania infection in stray dogs in Lisbon.*]—*An. Inst. Med. Trop.* 4. 99–106. [Abst. in *Trop. Dis. Bull.* 45. 985. (1948), copied *verbatim*.] 1499

The English summary appended to the paper is as follows:—

“As a complement to the studies carried out in the Institute of Tropical Medicine on the epidemiology of the kala-azar, the authors have determined the rate of infestation by leishmaniae in vagrant dogs of Lisbon.

“For this purpose, from 1945 to 1947, they

searched for leishmaniae directly in spleen, as well as in liver smears of those animals, by culture of these organs (medium NNN) and in bone marrow and nasal mucus smears.

“Out of 137 dogs examined, 9 have been found infected, which gives an infection rate of 6·5 per cent., a percentage considerably higher as compared with those of 3·6 and 2·08 per cent. found by other investigators also in dogs of Lisbon in the periods of 1910–1912 and 1936–1938 respectively. In one of the dogs leishmaniae have been found in the nasal mucus.

“They also observed that the largest proportion of infected animals was found among the oldest dogs and that the infection rate in the females was larger than that of the males.”

GUIMARÃES, F. N. (1947.) Visceralização da “*Leishmania brasiliensis*” Vianna, 1911, em hamsters (“*Cricetus auratus*”). [*Visceral L. brasiliensis infection in hamsters (Cricetus cricetus = C. auratus).*]—*Brasil-med.* 61. 395–396 & 439 (Erratum). [Abst. in *Trop. Dis. Bull.* 45. 508. (1948), copied *verbatim*. Signed: C. M. WENYON.] 1500

With material taken from a sore containing leishmania, the author inoculated a hamster on the nose and in the peri-ocular region. Seven months later the animal was examined. There were no cutaneous lesions, but there was a generalized leishmania infection which is illustrated by photographs of a section of the spleen and a smear of the bone marrow. This appears to be the first record of a generalized infection with *Leishmania brasiliensis*. Similar infections have been produced by a number of observers with *Leishmania tropica*. In the second note, the name of the hamster is corrected to *Cricetus auratus* from *Cricetus cricetus*.

ANSARI, N. (1947.) Action de diverses préparations dénommées ‘vitamine B₁’ sur les cultures de *Leishmania tropica*. [Action of preparations of ‘vitamin B₁’ on cultures of *Leishmania tropica*.]—*Arch. Inst. d'Hessarek.* No. 5. pp. 78–79. 1501

An account of tests on commercial preparations of vitamin B₁, the product possibly containing other factors. The results cannot be assessed without knowledge of the nature of the products.

GEURDEN, L. M. G. (1947.) L'action des antibiotiques sur les protozoaires. [The action of antibiotics on protozoa.]—*Bull. Acad. vét. Fr.* 20. 425–427. 1502

Pure actively reproducing cultures of *Trichomonas hepatica* and *T. foetus* were used to study the action of various antibiotics *in vitro*. Penicillin and sodium propionate had no inhibitory action. The sulphonamides had a marked inhibitory

effect when used in higher concentrations than those used against bacteria. Thus concentrations of 1-1.5% were inhibitory whilst 0.5% produced no effect.

The author discusses the possibility of adding sulphonamides to bovine semen as a control measure against *Trichomonas* infection in artificial insemination.

Sodium propionate is of value in controlling mycotic contamination of cultures.—G. V. L.

FORD, C. M., & MORGAN, B. B. (1948.) The effects of *Vibrio fetus* on the growth of *Trichomonas foetus* (protozoa).—*J. Bact.* 55. 85-88. [Authors' summary copied verbatim.] 1503

Vibrio fetus extended the *in vitro* growth of *Trichomonas foetus*, as determined by direct microscopic counts of the trichomonads with a hemocytometer. An atmosphere of 10 per cent carbon dioxide extended the *in vitro* growth of trichomonads by 24 hours over the normal control.

These extensions are believed to be caused by (1) the release of nutrients favorable to the growth of trichomonads, (2) the slower rate of change in the hydrogen ion concentration of the culture medium, and (3) the lowering of the oxygen tension of the atmosphere with carbon dioxide.

Filtration of Schneider's modified medium with "norite" increased the area of growth of *Vibrio fetus*.

HITCHCOCK, D. J. (1948.) The inhibition of bacteria by the metabolic products of trichomonads.—*J. Parasit.* 34. 114-118. 1504

The Oxford cup plate assay was used. *Tr. foetus* was cultured in Schneider's citrate medium, and *Tr. vaginalis* in C.P.L.M. [cysteine-peptone-liver infusion-maltose] medium. The assay method was as follows:—A dilution of 24-hour broth culture in an agar base was evenly distributed over agar plates. When the inoculum was firm sterile porcelain Oxford plates were arranged on each assay plate. Into the Oxford plates was placed supernatant fluid from centrifuged trichomonads. Suitable pH adjustments were made to controls. It was concluded that certain strains of *Tr. foetus* produced inhibition of *Salmonella pullorum*, *Corynebact. renale*, and *S. schottmuelleri*. It was also found that sodium citrate was unnecessary in Schneider's citrate medium for the growth of *Tr. foetus*, quantitative determinations showing that citrate was neither synthesized nor utilized. Neither the citrate nor the pH changes in the culture were responsible for the inhibition of *S. pullorum* by *Tr. foetus*, while there was no evidence of inhibition of bacterial growth by two- and three-day cultures of *Tr. vaginalis*.—G. M. U.

I. WALKER, R. V. L. (1948.) Enterohepatitis (blackhead) in turkeys. I. *Pentatrichomonas* associated with enterohepatitis and its propagation in developing chick embryos.—*Canad. J. comp. Med.* 12. 43-46. 1505

II. SWALES, W. E. (1948.) Enterohepatitis (blackhead) in turkeys. II. Observations on transmission by the caecal worm (*Heterakis gallinae*).—*Ibid.* 97-100. 1506

III & IV. SWALES, W. E., & FRANK, J. F. (1948.) Enterohepatitis (Blackhead) in turkeys. III. Observations on the susceptibility of young poults. IV. Trials with chemotherapy.—*Ibid.* 141-143; & 143-146. 1507

I. *Pentatrichomonas* was found associated with the caeca or caecal lesions of turkeys involved in an outbreak of enterohepatitis. The presence of *Histomonas meleagridis* was not demonstrated. *Pentatrichomonas* was isolated in fertile incubated eggs by the use of penicillin and streptomycin. The organism was successfully propagated in eggs. A method of fixation is described permitting the successful staining of the organism with Giemsa stain. The usual methods of fixation were not satisfactory.

II. Enterohepatitis was produced in turkeys by washed, embryonated caecal worm eggs given by mouth; by the intra-caecal inoculation of washed infective larvae; and by intra-caecal inoculation of larvae that had been treated with hydrogen peroxide. Caecal worm eggs, fresh and embryonated, failed to produce the disease when ground by means of a tissue grinder until no recognizable egg particles remained. Eggs were embryonated in a semi-dry state in watch glasses in a closed container without the development of moulds or other undesirable organisms.

III. Poults were exposed to a natural source of infective material at three, ten and 17 days of age. In the majority of cases the disease did not appear until the birds were about three weeks old, which time is considered to be the approximate age of susceptibility to natural infection. Poults exposed at a non-susceptible age did not acquire a low-grade infection capable of immunizing them against fatal enterohepatitis in later life. The disease differs from coccidiosis in this respect.

IV. Small-scale tests of sulphamerazine, sodium sulphamethazine, emetine hydrochloride, atebirin hydrochloride, a quaternary ammonium compound (formula 144) and an antimony compound (stibophen) did not appear to alter the course of enterohepatitis in poults. The experimental birds were exposed in pens with soil floors contaminated with chicken faeces.—R. GWATKIN.

COLLIER, H. B., & SWALES, W. E. (1948.) On the chemotherapy of caecal coccidiosis (*Eimeria tenella*) of chickens. VI. A note on the metabol-

ism of caecal epithelium, normal and parasitized.—*Canad. J. Res.* 26. Sect. D. 77-81. 1508

The values obtained for respiration and anaerobic glycolysis of caecal tissue of chickens were similar to those of rat intestine. In parasitized caecal tissue there was no increase in rate of respiration compared with that of normal tissue. There was a slight decrease in the acute stages when the mucosa was congested and haemorrhagic. There was a slight but statistically insignificant increase in anaerobic glycolysis the third day after infection, especially when mucosa alone was used. Intestinal tissue possesses an active metabolism and any additional activity due to the parasites is scarcely measurable. Sulphamerazine is a strongly coccidiostatic drug and might be supposed to inhibit the metabolism of the coccidia but, since additional activity due to the parasites was not measurable, no effect of the drug could be observed.—R. GWATKIN.

GERUNDO, M. (1948.) Control of hepatic coccidiosis of rabbits with succinylsulfathiazole U.S.P. A study of the mode of action of the sulfonamides.—*Arch. Path.* 46. 128-131. [Author's summary copied *verbatim*.] 1509

Succinylsulfathiazole has been tested on rabbits infected with *Eimeria stiedae*. In the first series of experiments, the rabbits were infected with 10,000 oocysts of *E. stiedae*, and one half of them were given 0.5 Gm. of the sulfonamide, mixed with the feed, daily for a period of 14 to 16 days. The untreated infected animals showed typical lesions of coccidiosis of the liver, whereas the infected animals treated with succinylsulfathiazole showed no lesions of the liver. Since the results were uniform in all the animals and no toxic effects were observed as a consequence of the administration of the drug, it is hoped that this widespread infection may be successfully treated. From the study of the histologic material it seems likely that the sporozoites are carried through the portal vein to the liver, where either they are inhibited in their progression toward the biliary epithelium or, if they reach there, they are prevented from dividing.

WILSON, J. E. (1949.) Mepacrine hydrochloride in the treatment of avian coccidiosis. [Correspondence.].—*Nature, Lond.* 163. 250. 1510

Forty 10-day-old chicks were dosed with *Eimeria tenella* sporocysts and 24 hours later were given 0.1 g. of mepacrine hydrochloride in four pints of drinking water after which they were kept under conditions where repeated infection was likely to occur. Drinking water containing the mepacrine hydrochloride was given daily, but seven chicks died from acute caecal coccidiosis.

In a control group supplied with ordinary drinking water 26 chicks died from the disease.

The experiment was repeated using 21-day-old chicks which were kept in a brooder on a wire floor after the initial infection in order to prevent repeated infection. Seven chicks died in the group receiving mepacrine hydrochloride, while 23 died in the control group.

The drug was well tolerated and it is considered likely to prove of use in the control of avian coccidiosis if used in higher concentration and in the event of the development of strains of coccidia resistant to the sulphonamides which have already proved of such great importance.

—S. BRIAN KENDALL.

VINCKE, I. H., & LIPS, M. (1948.) Un nouveau plasmodium d'un rongeur sauvage du Congo, *Plasmodium berghei* n. sp. [*Plasmodium berghei*, a new plasmodium of a wild rodent in the Belgian Congo.].—*Ann. Soc. Belge de Med. Trop.* 28. 97-104. [Abst. in *Trop. Dis. Bull.* 45. 979. (1948), copied *verbatim*. Signed: P. C. C. GARNHAM.] 1511

A new *Plasmodium* (*P. berghei*) from Congo tree rats is described. The rats belonged to at least 5 species, including *Thamnomys surdaster*: 14 out of 93 rats showed parasites in the blood. The infection can be transferred with ease to white mice and to rats (*R. r. frugivorus* and *alexandrinus*), in which animals it causes a heavy parasitaemia followed by death between the 11th and 15th days. In inoculated wild rats, the infection as a rule is less severe. There is enormous enlargement of the spleen and liver, which are heavily pigmented.

The blood of infected animals shows ring forms usually with one chromatin dot, followed by schizogonic forms. When mature, these divide into 6 to 20 merozoites surrounding a central mass of black pigment. Macro- and microgametocytes are produced; these have fine black pigment and measure 7 to 8 μ in diameter. The most characteristic features of the parasites are two—the frequency with which multiple infections of the erythrocyte occur and the gross enlargement of this cell. Sometimes six rings are found in a single cell and the cytoplasmic masses are apparently continuous. The absence of pigment is about the only feature which enables such forms to be distinguished from schizonts. The diameter of the rat's corpuscles is normally between 5 and 6.5 μ ; infected corpuscles enlarge to 10.6 μ . Stippling does not occur.

The insect vector of *P. berghei* is most probably *Anopheles duren*; common anophelines (e.g., *A. gambiae*) of the region failed to transmit it. Before the discovery of this parasite, *A. duren* had often been found infected with sporozoites in

the salivary glands (7 per cent. rates). It had been found in large numbers gorged with blood, in the tree canopy of the forest near Elisabethville. The blood was mammalian but rarely or never human, dog, cat or antelope. The authors therefore looked for an animal host prevalent in the forest canopy and they incriminated the tree rats, a successful climax to a very intelligent piece of field work. During the 1947-1948 season, *A.*

See also *absts.* 1684 (trypanosomes); 1685 (staining trypanosomes); 1712 (toxoplasmosis); 1714 (history of a swamp in Algeria).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

ANON. (1948.) **F & M slaughter program abandoned.**—*Vet. Med.* 43. 12. 1512

This is a comment on the decision to abandon the slaughter policy in the areas affected with foot and mouth disease in Mexico. Vaccination is now to be adopted. The writer of the note is apparently biassed in favour of vaccination.—M. C.

MANNINGER, R. (1948.) **A new vaccine against sheep pox.**—*Acta vet. hung.* 1. 43-45. [In English.] 1513

Continental shepherds frequently vaccinate lambs with unattenuated virus as a protection against sheep pox, and this practice perpetuates the disease. Adsorption on aluminium hydroxide did not sufficiently attenuate the virus, but the addition of formalin to this adsorbed virus yielded a satisfactory vaccine which was "generally free from infective agents, even from bacteria". Few details are given, owing to loss of records during the siege of Budapest, but M. claims satisfactory results in laboratory and field trials.

—G. B. S. HEATH.

FENNER, F. (1948.) **The pathogenesis of the acute exanthems. An interpretation based on experimental investigations with mousepox (infectious ectromelia of mice).**—*Lancet.* 255. 915-920. [Author's summary copied *verbatim.*] 1514

Mousepox (infectious ectromelia of mice) is a good laboratory model for the study of the acute exanthems.

Multiplication of the virus at the site of entry of the virus reaches almost its highest titre before any lesion is evident macroscopically. A complicated series of events occurs between infection and the end of the incubation period: the virus passes to the regional lymph-node and multiplies there; small amounts of virus pass into the blood-stream and undergo phagocytosis by cells of the reticulo-endothelial system; the virus multiplies in the organs (liver and spleen) rich in these cells, and necrosis of infected cells adjacent to sinusoids produces a secondary viraemia; and the virus thus distributed causes focal infection of cells of the epidermis. Virus deposited in the skin

dureni failed to show infections in the glands (out of 1,208 examined) and so far sporozoite transmission from this mosquito to the rat has not been made. Parasites resembling *P. berghei* have, however, been found in the gut of wild-caught *A. dureni*, and in one case the contents of the gut, when inoculated into a white mouse, gave rise to a fatal infection due to a parasite apparently identical with *P. berghei*.

multiplies for several days before any macroscopic lesions appear. Clinical recovery and the disappearance of virus are closely correlated with the appearance of circulating antibody. This interpretation of the pathogenesis of mousepox provides a good explanation of the known facts in smallpox, chickenpox, and measles.

It is suggested that the concept of a primary lesion (which may or may not be clinically apparent), an internal focus of multiplication, and a secondary liberation of the virus or bacterium into the blood-stream, with the production of focal lesions in the skin and elsewhere, may prove useful in studies of the pathogenesis of many human diseases.

The description of the period of the onset of symptoms in smallpox and measles as the stage of "invasion" is erroneous, for the blood-stream and the organs are invaded during the incubation before symptoms arise.

MACEK, K. (1947.) **Chřipka u domácích zvířat. [Influenza in domestic animals.]**—*Čas. československ. Vet.* 2. 520-529. 1515

M. considers swine fever, swine influenza and infectious Teschen disease in pigs to be variations of the same virus infection. The general symptoms are very similar. Some are more dominant, according to the course and form the infection takes. Important factors are age, general condition and physical resistance of the animals concerned.

Rabbits infected with a brain suspension from pigs that had died of swine fever developed paralysis and spasms. The histological changes in the brains of pigs that had died of swine fever and Teschen disease were identical. Brain material from an influenza-infected pig was administered by three different methods, *i.e.*, by subdural and intramuscular injection and *per os* to rats, rabbits, cats, dogs and cattle. The following results were obtained:—

Subdural infection caused paralysis and spasms in rats and rabbits. Cats and dogs fed on infected brain developed symptoms very similar to hydrophobia, ending with paralysis.

The symptoms preceding paralysis were identical with those of Aujeszky's disease. Histological examination did not reveal the presence of Negri bodies. Infection by the intramuscular route caused itch and similar symptoms. A ten-year-old cow died of complete paralysis ten days after intramuscular infection without earlier symptoms. P.M. examination revealed changes in the respiratory and digestive organs similar to those occurring in cases of natural influenza.—E. G.

BEARD, J. W., McLEAN, I. W., Jr., & BEARD, D. (1947.) **Protective value of influenza vaccine assayed in swine.**—*Sth. med. J., Nashville.* 40. 608–618. [Abst. in *Bull. Hyg., Lond.* 22. 728, copied *verbatim*. Signed: D. J. BAUER.] 1516

A swine influenza vaccine was made from virus obtained from chorio-allantoic fluid, purified by the usual procedures and inactivated with formalin. A dose ranging from 0.125 to 2.0 mgm. of virus was given to groups of pigs. Antibodies appeared, reaching maximum titre at 9 days. The height of the titre was not greatly influenced by increasing the dose, and it was found that high titres could be obtained with maximum economy of virus by giving two small divided doses at an interval of 21 days. Immunity was tested by challenge with active virus; 110 pigs were used, including 22 vaccinated controls and 21 animals after recovery from the natural disease. Morbidity, calculated on an arbitrary scale, was reduced from 88.6 units in the controls to 58.9, in the vaccinated animals. The number of doses of vaccine given had no apparent effect on morbidity, and the degree of protection conferred was in any case not great, since morbidity in the recovered animals was as low as 16.7 units. The animals were then regrouped; 24 were revaccinated, and 26 were left as controls. Both groups were given active virus, and the ensuing morbidity was essentially the same in both groups (18). Immunity, therefore, depends largely upon previous contact with active virus, and cannot be greatly increased by vaccination. The authors point out the parallel between these observations and the similar position with regard to human influenza.

DE ST. GROTH, S. F. (1948.) **Destruction of influenza virus receptors in the mouse lung by an enzyme from *V. cholerae*.**—*Aust. J. exp. Biol. med. Sci.* 28. 29–36. [Author's summary copied *verbatim*.] 1517

By treatment with preparations from filtrates of *V. cholerae* containing the enzyme R.D.E. [receptor destroying enzyme], excised mouse lungs are rendered incapable of absorbing influenza virus B (strain (Lee)). Such preparations remove absorbed heated or active virus quantitatively from the lung.

The results are consistent with the hypothesis that the *V. cholerae* enzyme destroys the receptors by which influenza viruses make their initial effective contact with susceptible cells.

I & II. HIRST, G. K. (1949.) **The nature of the virus receptors of red cells. III. Partial purification of the virus agglutination inhibitor in human plasma. IV. Effect of sodium periodate on the elution of influenza virus from red cells.**—*J. exp. Med.* 89. 223–232; & 233–243. [Author's summaries copied *verbatim*.] 1518

I. A substance (VHI) exists in human plasma which inhibits the agglutination of red cells by influenza virus and is distinct from influenza antibody. When plasma is fractionated by alcohol in the cold the VHI comes out mainly with a mixture of lipid-free alpha and beta globulins (fraction IV–4). On further fractionation the activity comes out with a fraction consisting mainly of beta₁ globulin (fraction IV–7). Boiling fraction IV–4 or IV–7 after considerable dilution brings about a large increase in the amount of VHI, much more than can be detected in the original plasma. A similar VHI has been extracted from the ghosts of fowl red cells.

II. Influenza virus, treated with sodium periodate, was adsorbed well on red cells but lacked the capacity for spontaneous elution. Heated virus was eluted from red cells by the action of cholera vibrio filtrate, unheated influenza virus, and to a small extent by heating at 56°C. Periodate-treated virus was not elutable by these methods but was liberated by exposure of the adsorbing cells to concentrations of sodium chloride of 5 to 10 per cent. This treatment had no effect on elution of heated virus.

MAURER, F. D. (1949.) **The separation of viruses from bacterial contaminants.**—*Bull. U.S. Army med. Dep.* 9. 351–354. 1519

The method consists of allowing the fluid containing the virus to be absorbed from one end of a sterile absorbent wick consisting of a strip of filter paper. The method has been used with success to separate equine encephalomyelitis viruses from *Bact. coli*, streptococci and other bacteria.

DOMANSKÝ, F. (1948.) **Příspěvek k hematologické diagnóze nakažlivé chudokrevnosti a k její terapii. [A contribution to the haematological diagnosis of infectious anaemia and to its therapy.]**—*Čas. československ. Vet.* 3. 493–497. [English, French and Russian summaries.] 1520

D. recommends the investigation of the blood picture to confirm the clinical diagnosis of infectious anaemia. During fever-free periods, infected

horses have an increased number of lymphocytes and a decreased number of neutrophils, this relation being reversed during fever periods.

Monthly intramuscular injections of 3-5 ml. of vigantol yielded satisfactory results, but further experiments on a larger scale are necessary.—E. G. NEITZ, W. O. (1948.) **Immunological studies on bluetongue in sheep.**—*Onderstepoort J. vet. Sci.* 23. 93-136. 1521

This important paper records the results of experiments extending over a number of years on some 1,500 sheep and merits the close attention of all workers on immunization against virus diseases.

A method of immunization against bluetongue developed by Theiler has been in use in S. Africa for many years and has been a boon to the sheep breeding industry. The method depended upon injection of living virus which had been passaged artificially in sheep for a number of generations. It was believed that as a result of this serial passage in the laboratory the virus had become attenuated.

Although the vaccine had in general given good results it was never really satisfactory because it was not safe, since on occasion severe illness followed its injection into susceptible sheep, and also because the immunity did not appear to be durable in many cases.

Complaints against the method in the past had been explained by the belief that severe losses following vaccination had been due to other causes such as natural infection prior to vaccination or to intercurrent worm infestation. Failure to produce adequate immunity was thought to be possibly due to the natural short duration of immunity to the disease and as a result the practice of immunizing twice during each bluetongue season was fairly generally adopted.

During recent years sheep of British mutton breeds have been increasing in S. Africa and complaints of bad results had become more frequent, necessitating a detailed reinvestigation of the disease and of the virus. The paper now under consideration reports the results obtained so far.

During the course of years ten strains of virus including Theiler's original strain and one obtained from sheep in Cyprus have been collected at Onderstepoort. The results of N.'s study of these strains are given in detail and are tabulated. They indicate that these strains differ markedly in antigenicity and in virulence. The work is not yet sufficiently advanced to permit of exact classification of these ten strains. The results also show that the immunity conferred by any one strain is solid against challenge with homologous virus. Strains vary in respect of their ability to

confer some measure of group immunity against heterologous strains and it would appear that the choice of two strains for the standard vaccine had been unfortunate as they produce by far the least polyvalent immunity.

It is apparent that the belief that a field strain of virus may be attenuated by passage in sheep is not correct. The vectors of the parasite are *Culicoides* spp. and it would appear that some adaptation to a mammalian host may occur during the course of serial passage by inoculation in sheep, but this adaptation does not cause a progressive attenuation of virulence. It has been found [*V. B.* 16. 223] that solar radiation has a marked adverse effect on the course of the disease. When sheep at the laboratory are housed and so not exposed to solar radiation the course of the disease is mild and this had probably given rise to the belief that virulence was attenuated by passage in sheep. Sheep of the Dorset Horn breed have been found to be much less resistant to the disease than Merinos and this may prove to be true of other British breeds which have not yet been tested.

It is considered that immunization using a single strain of virus can only be effective in an area where that strain predominates in nature. Further investigations are necessary as it is now apparent that a vaccine for universal use must have as its basis a full appreciation of the plurality of virus strains both in respect of antigenicity and virulence.—M. C.

GEIGER, W. (1946.) Experimentelle Untersuchungen zur aktiven Immunisierung gegen Schweinepest. [**Experimental investigation of the active immunization of swine fever.**]—*Dtsch. tierärztl. Wschr.* 53. 129-138. 1522

Many different attempts to produce a vaccine for active immunization against swine fever have been made in the past. The virus contained in the blood or organs of diseased animals has been dried, heated and combined with various substances, and many different methods have been used in these processes. The author tested all these various procedures and came to the conclusion that attempts to produce immunity in pigs have so far been unsuccessful. He considers Dorset's crystal violet vaccine described by McBRYDE & COLE [*V. B.* 8. 92.] to be the most promising preparation so far, though this is not yet suitable for practical purposes.—E. K.-N.

MANNINGER, R. (1948.) **Infectious gastro-enteritis of swine.**—*Acta vet. hung.* 1. 1-6. [In English.] 1523

An acute gastro-enteritis of weaned and fattening pigs is described. The alimentary lesions consisted of a diffuse neurosis with pseudo-mem-

brane formation. Degeneration of the heart muscle was also commonly seen.

Bacteriological examination was negative. Blood from pigs in affected herds which had a febrile reaction was used for transmission experiments. This blood, either fed or inoculated, filtered or unfiltered, produced a temperature reaction in two days with symptoms of gastro-enteritis in a proportion of pigs.

Outbreaks of swine erysipelas frequently followed gastro-enteritis and it was concluded that the gastro-enteritis predisposed to the erysipelas. M. concluded that a virus was responsible for this type of gastro-enteritis in Hungary.—D. LUKE.

WHITEHAIR, C. K., GRUMMER, R. H., PHILLIPS, P. H., BOHSTEDT, G., & McNUTT, S. H. (1948.) *Gastroenteritis in pigs.*—*Cornell Vet.* 38. 24-39. 1524

This paper deals with outbreaks of gastro-enteritis in the University of Wisconsin herd since 1940. The disease assumed an acute form in 1947 when 70% of baby pigs died.

Typically the condition affects pigs 3-4 weeks old with bouts of diarrhoea of 3-5 days' duration alternating with constipation. Death may occur in 2-3 weeks or chronic symptoms may persist for months with severe stunting of growth. In some cases lameness and swollen joints are seen. Practically all pigs in all litters had some symptoms. Cases occurred throughout the year.

Bacteriological examination of various tissues on different media did not give any consistent result. Swine erysipelas and swine fever were negative. No toxic factor could be demonstrated in the sows' milk.

The relationship of the condition to nutrition was extensively studied and a further report on this aspect will appear later. Limited transmission experiments tend to indicate that an infectious agent is involved.—D. LUKE.

FEENSTRA, E. S., THORP, F., JR., GRAY, M. L., & McMILLEN, W. N. (1948.) *Transmissible gastroenteritis of baby pigs.*—*J. Amer. vet. med. Ass.* 113. 573-575. 1525

The author describes experiments in the transmission of gastro-enteritis of baby pigs. The condition could be transmitted by feeding infective material and by contact. Bacterial free filtrates were also capable of setting up the disease. These findings are similar to those reported by DOYLE & HUTCHINGS [*V. B.* 17. 266.].—D. LUKE.

HAIG, D. A. (1948.) *Preliminary note on the cultivation of Green's distemperoid virus in fertile hen eggs.*—*Onderstepoort J. vet. Sci.* 23. 149-155. 1526

The cultivation of Green's ferret-adapted distemper virus on the chick embryo is reported.

Virus was obtained from an ampoule of vaccine labelled "Canine Distemper Vaccine, Ferret origin, Green Method". [This presumably had been obtained from the U.S.A. although this is not stated.]

Inoculation was on to the chorio-allantoic membrane on the eighth day of incubation. Eggs were incubated at 35°C. in a forced draught incubator. Material for the first inoculation was obtained from a ferret which had been injected with the contents of the vaccine ampoule; the ferret was killed on the fifth day after injection at which time its temperature was "markedly elevated". Thirty serial passages were made usually at four-day intervals. In the earlier passages no marked macroscopic changes were observed in the eggs, but in later passages the membranes were thickened, moist, and had numerous minute light grey foci which tended to coalesce. A few embryos died. Material from the 3rd, 5th, 8th, 14th, 16th and 21st passages was tested for virulence by intraperitoneal inoculation of ferrets. All ferrets reacted after an incubation period which varied from 2-14 days depending upon the concentration of the suspension injected. Three types of reaction were observed; peracute, in which there was no rise of temperature but the ferrets became sick, refused food and died after two or three days; acute, in which there was high temperature up to 107.5°F. for about six days which then fell rapidly before death; and subacute, with a high temperature and a prolonged illness with the eyelids and lips encrusted and refusal to eat.

Laboratory bred distemper-free dogs were not available, but 13 dogs obtained from colleagues were injected subcutaneously. Most of these did not react but three had rises of temperature, eye lesions and pustules, and one Pointer pup two months old developed nervous symptoms and died.

Anti-distemper serum obtained from Messrs. Burroughs Wellcome, England, neutralized virus of the 21st egg passage when tested on a ferret; a control ferret died.

Material from the 16th egg passage was instilled into the nostrils of 12 white mice, all of which remained healthy.

They were killed and lung suspension was instilled into the nostrils of other mice. This process was repeated seven days later. No lung lesions were produced in the mice.

An attempt was made to use the egg-passaged virus in haemagglutination tests with chick and g. pig red cells. Quite irregular partial haemagglutination was observed only in the presence of high concentrations of virus.

H. concludes from the clinical nature of the disease produced in ferrets and dogs and the

specific neutralization by canine anti-distemper serum, that the virus propagated for 30 passages in eggs was distemper virus. Chance infection with influenza virus is excluded by the failure to infect mice and by the results of the haemagglutination tests. Contamination with other viruses maintained at the laboratory is confidently excluded. Since no other strain of distemper virus was being investigated or could possibly have been a source of contamination, it is believed that it was Green's ferret-adapted or "Distemperoid" virus which was propagated.—M. C.

HAMRE, D., RAKE, H., & RAKE, G. (1947.)
Morphological and other characteristics of the agent of feline pneumonitis grown in the allantoic cavity of the chick embryo.—*J. exp. Med.* 86. 1-6. 1527

The causal agent of feline pneumonitis has been grown in the chick allantoic cavity for 50 serial passages. The maximum titre of the agent in each embryo was reached on the fifth day after inoculation. The mortality amongst the embryos varied a good deal. Suspensions of heavily infected chorio-allantoic membranes were rapidly fatal to mice when inoculated intravenously. This suggested the presence of a toxic factor which was then confirmed by toxin antitoxin neutralization tests.

Electron micrographs of the infectious agent showed that the elementary body is composed of a dense central substance, surrounded by a thinner material. The average diameter of the gold shadowed bodies was 525 μ .—A. R. JENNINGS.

I. LEFTWICH, W. B., & MIRICK, G. S. (1949.)
The effect of diet on the susceptibility of the mouse to pneumonia virus of mice (PVM). I. Influence of pyridoxine in the period after the inoculation of virus.—*J. exp. Med.* 89. 155-178. [Authors' conclusions copied *verbatim*.] 1528

II. MIRICK, G. S., & LEFTWICH, W. B. (1949.)
The effect of diet on the susceptibility of the mouse to pneumonia virus of mice (PVM). II. Influence of pyridoxine administered in the period before as well as after the inoculation of virus.—*Ibid.* 175-184. [Authors' conclusions copied *verbatim*.] 1529

I. Young mice fed diets deficient in pyridoxine or fed desoxyypyridoxine after the inoculation of the pneumonia virus of mice were more resistant to infection than well nourished controls. The susceptibility of young mice to PVM increased with the duration of pyridoxine administration after inoculation.

Dietary protein restriction when pyridoxine was provided did not affect the susceptibility of mice to PVM. The PVM-combining capacity of

mouse lung and the titer of humoral antibody against PVM were the same in mice fed a complete or pyridoxine-deficient diet for 6 days. The amount of PVM in mouse lungs 6 days after inoculation was greater by both infectivity and hemagglutination titrations in mice fed pyridoxine than in pyridoxine-deficient controls. This suggests that pyridoxine was essential during the postinoculation period for optimal virus multiplication.

II. Young mice fed diets deficient in pyridoxine for 8 days or longer before the inoculation of PVM, as well as after inoculation, were more susceptible to infection than control mice fed complete diets. Young mice fed a pyridoxine-deficient diet gained weight as well as controls fed a complete diet for 5 weeks, but they lost weight in the 6th week. The ratio of thymus or spleen weight to body weight was less in mice fed a pyridoxine-deficient diet for 6 weeks than in controls fed a complete diet. Histologically the thymuses and spleens showed hypoplasia. No measurable difference in antibodies against PVM was found in the sera of uninoculated mice fed complete or pyridoxine-deficient diets for 6 weeks.

ASPLIN, F. D. (1949.) **Observations on the viability of Newcastle disease virus.—*Vet. Rec.* 61. 159-160. 1530**

As a result of the isolation of virus from the skin of eviscerated Hungarian poultry which had been imported into England, experiments were undertaken to determine the period of survival of virus in carcasses. Cockerels were killed four days after artificial infection. Some were plucked, eviscerated and wrapped in paper, others were unplucked. They were stored, some at 34-35°F. and others at -4°F. In those stored at 34-35°F. infection persisted up to 196 days, while in those stored at -4°F. it persisted more than 300 days.

Tests of survival of virus under laboratory conditions were also made and the results are tabulated. The effectiveness of a number of disinfectants was also tested.

The speed of inactivation by formalin was influenced markedly by variations in temperature and concentration.

A pig inoculated intramuscularly excreted virus for 48 hours and two rats dosed by the mouth excreted virus in the faeces for 24 hours.—M. C.

MORGAN, I. M. (1948.) **Immunization of monkeys with formalin-inactivated poliomyelitis viruses.—*Amer. J. Hyg.* 48. 394-406. [Author's summary copied *verbatim*.] 1531**

Poliomyelitis virus adequately treated with formalin is no longer infectious by the most sensitive test available, i.e., by intracerebral injection in monkeys. Such a formalin-inactivated

vaccine has been used to immunize monkeys by repeated intramuscular injection.

I. HUEBNER, R. J., JELLISON, W. L., BECK, M. D., PARKER, R. R., & SHEPARD, C. C. (1948.) **Q fever studies in Southern California. I. Recovery of *Rickettsia burneti* from raw milk.**—*Publ. Hlth Rep., Wash.* 63. 214-222. [Parts II & III in press.] 1532

II. JELLISON, W. L., BELL, E. J., HUEBNER, R. J., PARKER, R. R., & WELSH, H. H. (1948.) **Q fever studies in Southern California. IV. Occurrence of *Coxiella burneti* in the spinose ear tick, *Otobius megnini*.**—*Ibid.* 1483-1489. 1533

III. JELLISON, W. L., ORMSBEE, R., BECK, M. D., HUEBNER, R. J., PARKER, R. R., & BELL, E. J. (1948.) **Q fever studies in Southern California. V. Natural infection in a dairy cow.**—*Ibid.* 1611-1618. [Authors' summary slightly amended.] [Parts VI and VII in press.] 1534

IV. JELLISON, W. L., HUEBNER, R. J., BECK, M. D., PARKER, R. R., & BELL, E. J. (1948.) **Q fever studies in Southern California. VIII. Recovery of *Coxiella burneti* from butter made from naturally infected and unpasteurized milk.**—*Ibid.* 1712-1714. [Authors' summary slightly amended.] 1535

I. Q fever is endemic in Southern California and 50% of the cases occurred in people who were either dairy workers or lived close to dairies; epidemiological considerations indicated that certain dairies might be sources of infection.

Milk samples from the suspected dairies were tested by subcutaneous and intraperitoneal injection into g. pigs. Rickettsial organisms identified as *R. burneti* were recovered from the milk samples at three different laboratories. Of 50 milk samples examined 40 proved to be infected.

In one dairy 12.5% of 1,050 cows had antibodies on testing by the complement fixations test and 28 cases of Q fever were found in persons living or working in close proximity to the dairy. Thirty-three pooled milk specimens from 83 groups of cows in this dairy were injected into g. pigs. Twenty-six of them produced febrile reactions after an incubation period of from 5-17 days and 29 of them produced serum antibodies in the g. pigs which were bled 80 days after inoculation; four specimens failed to produce either fever or antibodies. On P.M. examination of g. pigs killed at the time of febrile reaction the spleens were enlarged and friable and there were subcutaneous indurated non-suppurative inflammatory reactions. Eight strains of rickettsia were isolated in the yolk sac of developing hens' eggs by inoculation with infected g. pig blood and tissues. These strains could not be distinguished from known strains of *R. burneti*. One strain

recovered in developing hens' eggs from a sample of milk from which *R. burneti* was not recovered by inoculation of g. pigs caused fever, ecchymosis, necrosis of the scrotum and frequently death when inoculated into male g. pigs. It was proved by cross immunity and complement fixation tests to be immunologically distinct from *R. burneti*.

In another dairy where the owner's son had recently contracted Q fever milk samples from five cows were tested. Three proved to be infected.

Infected cows were found in three other dairies. None of the cows shedding *R. burneti* in their milk had any perceptible illness. A few cows which had clinical mastitis were tested and were found to be negative for *R. burneti*. The organism was not recovered from the blood, urine or faeces of infected cows, nor was it recovered from blood and spleen tissue of four calves which had fever and diarrhoea. While there is apparently some connexion between the human and bovine infections it has not yet been proved that milk is the vehicle of infection.—M. C.

II. In Los Angeles County, conditions for Ixodid ticks are unfavourable, the only tick found being the Argasid, *Otobius (Ornithodoros) megnini*. Collections of 1-25 partially-engorged or engorged nymphs, from the ears of one or more cows, were tested by inoculation into g. pigs. Of 246 batches, ten proved to be infected. These batches came from four dairies, in the cows of which infection was demonstrated either by the detection of complement fixation antibodies in the blood or by the injection of milk into g. pigs.

The life cycle of *O. megnini* is peculiar in that this species passes the larval and nymphal stages on the one host before dropping to moult. The adults do not feed. For the species to be able to transmit Q fever, therefore, infection must be passed through the egg. This has not yet been demonstrated. Transovarial transmission has been reported in the related species, *Ornithodoros moubata*.—J. RICHARD HUDSON.

III. A mature dairy cow known to be shedding Q fever rickettsiae in its milk and whose serum gave a positive complement-fixation test with Q fever antigen was autopsied. Both on the basis of serology, and discharge of the infectious agent in milk, infection had been present over a period of at least 2 months. The few lesions observed were nonspecific and could not be attributed definitely to Q fever, since the pathology of acute or chronic *Rickettsia burneti* infection in cattle is practically unknown.

Tests of milk and numerous tissues for infectivity by maceration and injection into guinea pigs demonstrated *R. burneti* in the milk and udder tissues of all four quarters and in the supra-

mammary lymph nodes proximal to the udder.

One of eight experimental animals injected with lung tissue developed antibodies to Q fever but on a repeat test of two samples of lung tissue, all eight test animals remained negative.

No infection was demonstrated in the other tissues or fluids from this cow or from blood, spleen, kidney, amnion or amniotic fluid from its 5-month-old fetus.

IV. Fresh milk from a dairy, the raw milk from which was known to contain *Rickettsia burneti*, was used without pasteurization for the preparation of butter. The serums of guinea pigs (taken from survivors 29 to 32 days after injection)

See also absts. 1538 (Newcastle disease); 1570 (ticks transmitting encephalitis); 1613 (jaagsiekte); 1695 (staining rickettsia).

used to test the fresh milk, butter, and butter-milk were serologically positive for Q fever. Refrigerated butter was still infectious 41 days after preparation. A passage strain of Q fever was established from one of the test animals.

STOKER, M. G. P. (1949.) **Serological evidence of Q fever in Great Britain.**—*Lancet*. 256. 178–179. [Author's summary copied *verbatim*.] 1536

During an investigation of atypical pneumonia in Great Britain Q-fever complement-fixing antibodies were detected in serum from 8 of 24 patients examined. Two of these patients had never been overseas, and this is regarded as evidence that Q fever occurs in the British Isles.

IMMUNITY

VILCHES, A., & HIRST, G. K. (1947.) **Interference between neurotropic and other unrelated viruses.**—*J. Immunol.* 57. 125–140. 1537

The interference of viruses having little or no neurotropic tendencies with several neurotropic viruses was studied in mice. The interfering virus was inoculated by the intracerebral route in a dose of 0.03 ml. and after varying periods the challenge inoculum was injected in the same dose. Controls received an initial injection of a 10% suspension of chorioallantoic membrane in normal allantoic fluid followed by a challenge dose given in the same manner as to the experimental mice.

It was concluded that several different kinds of viruses (influenza, Newcastle disease and mumps) interfere with growth and lethal action of a number of neurotropic viruses, notably Western equine encephalomyelitis virus. Unusual features of these examples of interference were that the interfering viruses are not known to parasitize the cells in which neurotropic viruses normally multiply; the phenomenon was elicited when both the interfering and the challenge viruses were given simultaneously and the interfering virus had to be given in very high concentration in order to be effective.—M. C.

BANG, F. B. (1949.) **Cell blockade in Newcastle disease of chickens and chicken embryos.**—*J. exp. Med.* 89. 141–154. [Author's summary copied *verbatim*.] 1538

The problem of cell blockade or interference has been studied using Newcastle disease of chickens as a model. Embryos may be protected against the uniformly lethal effect of the virus by previous inoculation with ultraviolet-irradiated virus. It was necessary to use 0.5 to 1 mg. of partially purified washed virus in order to demonstrate this effect. Blockade by inactive virus in the embryo was not complete, since it could be overcome by inoculating increasing amounts of

active virus or by injecting the active virus into the allantoic sac instead of placing it on the membrane. The lethal effects of small doses of Newcastle virus could also be blocked by previous infection of the embryo with either swine influenza virus or human influenza A. Again this blockade may be overcome by using larger doses of active Newcastle virus.

Simultaneous injection of chickens with viruses of equine encephalomyelitis and a virulent strain of Newcastle disease virus merely delayed the incubation period of the Newcastle virus a day or so. Simultaneous inoculation of chickens with virulent and avirulent Newcastle strains caused complete blocking of the virulent strain. This blocking or interfering effect of the avirulent strain could be demonstrated 1 or 2 days after the inoculation of the virulent strain but was not effective after symptoms of the virulent disease had set in.

TYLER, A. (1948.) **Fertilization and immunity.**—*Physiol. Rev.* 28. 180–219. 1539

A review, with 251 references, of the work on fertilization, correlating the reactions involved with those of immunological processes. Fertilization involves the interaction of certain substances on and within the eggs and sperm—some in the manner of antigen and antibody, some have enzymatic, and other detergent-like, action. They are concerned in the early phases, including the penetration of coats and membranes surrounding the egg and attachment to the surface. Their action in the later phases is for the most part unknown.—W. R. BETT.

FERGUSON, L. C. (1947.) **The blood groups of cattle.**—*J. Amer. vet. med. Ass.* 111. 466–469. 1540

The development of the study of blood transfusions, in general and in relation to cattle, is

briefly discussed. Earlier workers had demonstrated that bovine sera may normally contain agglutinins for the red blood corpuscles of other bovines, similar to the condition in human beings. These natural bovine agglutinins are not sufficiently well marked to permit direct blood grouping as in man. F. obtained sera with a high content of such agglutinins by repeated transfusions of blood from a specified donor. The recipient cows became sensitized to the donor's R.B.C.s, but frequently the immune sera were complex. By absorption technique such sera could be simplified until a single antibody was present. These sera were then used as standard antibodies for the detection of the corresponding antigens in the R.B.C.s of any bovine animal.

An inheritance study on hundreds of matings revealed that the antigens were inherited on Mendelian lines. Emphasis is laid upon the fact that all the cellular antigens of a calf's blood must be present in the blood of either or both of the parents. This finds application in cases of disputed parentage which may occur after artificial insemination, and four cases are quoted in illustration. F. suggests that a further application may arise if transmission of these characters is linked to transmission of the factors responsible for such characters as high milk production. If this is substantiated, a simple test of a calf's blood for the presence of a certain cellular antigen will give an indication of its potential productivity.

In the course of transfusions F. reports that on no occasion did an initial intravenous transfusion cause an allergic reaction. Second and subsequent transfusions from the same donor frequently caused reactions which could be elicited as long as one year after initial sensitization. With related individuals (*e.g.*, daughter to dam) reactions were absent or mild and the resulting titres of immune sera were low [1 : 32 to 1 : 256].

—R. J. FITZPATRICK.

MAYER, M. M., CROFT, C. C., & GRAY, M. M. (1948.) **Kinetic studies on immune hemolysis. I. A method.**—*J. exp. Med.* 88, 427-444. 1541

See also absts. 1438 (swine erysipelas); 1452 (*S. pullorum* infection); 1453 (immune reactions and bacterial metabolism); 1457, 1458 and 1461-1465 (brucellosis); 1471 (blackleg); 1473 (*Cl. welchii*); 1513 (sheep pox); 1516 (influenza); 1521 (bluetongue); 1522 (swine fever); 1531 (poliomyelitis).

PARASITES IN RELATION TO DISEASE [GENERAL]

SEDDON, H. R. (1947.) **Host check list of helminth and arthropod parasites present in domesticated animals in Australia. With notes on their presence in the several states and lists of parasites which have not become established, doubtful records, etc.** pp. 41. Canberra: Commonwealth of Australia. Department of Health Service Publication (Division of Veterinary Hygiene) No. 2. 1542

The parasites are listed alphabetically under

The speed of haemolysis with varying concentrations of complement and haemolytic antibody is studied under carefully controlled conditions and with accurate standardization of the reagents, the methods being given in detail. The lytic process is artificially arrested at intervals by the rapid withdrawal of a sample and immediate delivery into an ice-cold citrate solution which binds the Mg^{++} and Ca^{++} essential to the haemolytic process. After centrifugation the haemoglobin content of the supernatant fluid is determined spectrophotometrically.

The results indicate that when complement is present in excess both the speed and the final amount of haemolysis increases with greater concentration of antibody. Furthermore, the process continued, albeit slowly, during the entire period of observation [sometimes 20 hours] even with very small quantities of antibody. The authors point out the similarity to the catalytic velocity curves of enzymic reactions. A different picture is obtained when antibody is in excess, and the concentration of complement is varied. Under these circumstances, the initial velocity increases with greater concentrations of complement, but in every case the process stops after about one hour when the available content of complement is exhausted.

Since these two reactions represent extremes, an intermediate type was studied in which neither complement nor antibody were in excess. The lytic process stopped at different levels according to the amount of complement used. At this stage the sample was divided, and to one part further complement was added, and to the other, further antibody. Only in the former sample did lysis subsequently proceed.

The authors conclude that haemolytic antibody acts for long periods in small quantities without becoming exhausted, but complement acts for a short period and is exhausted. They speculate whether complement may be the active haemolytic agent, while the antibody acts as an enzyme and Mg^{++} as a co-enzyme.—G. F. R.

the general heading of the zoological class and the host or hosts indicated. The occurrence of the parasite in each of the states of Australia is noted. There are separate host lists with the parasites arranged alphabetically under their zoological classification. The hosts include the common domestic animals and the pigeon, dingo, fox, hare and rabbit and the kangaroo and wallaby in so far as they are hosts of parasites which occur in domestic animals.—H. MCL. GORDON.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

MUESEBECK, C. F. W. (1947.) **Common names of insects of medical importance approved by the American Association of Economic Entomologists.**—*Mosquito News*. 7. 70-72. [Abst. in *Trop. Dis. Bull.* 45. 547. (1948), copied *verbatim*. Signed : CHARLES WILCOCKS.] 1543

This is a short list of insects, classified in two forms: 1. By the common names with the scientific names appended (*e.g.*, American dog tick—*Dermacentor andersoni*), and 2 *Vice versa*. Its importance is that the names are approved, but some of them are only of local use. For instance the "common malaria mosquito" is *A. quadrimaculatus*.

GRAHAM, N. P. H. (1948.) **Control of ectoparasites of domestic animals.**—*Aust. vet. j.* 24. 257-259. 1544

In an address to the N.S.W. Division of the Australian Veterinary Association, Graham gave an outline of the general principles of the action and use of insecticides. Individual insecticides discussed included compounds of arsenic, fluorine, boron, sulphur, coal tar derivatives, nicotine, pyrethrum and rotenone. The synthetic insecticides were discussed, with special mention of D.D.T. and benzene hexachloride, and their specific uses.—H. McL. GORDON.

EADS, R. B. (1946.) **Control of the sticktight flea on chickens.**—*j. econ. Ent.* 39. 659-660. [Abst. from author's summary.] 1545

From the experiences in field control of *Echidnophaga gallinacea* on chickens, it is apparent that a thorough coating of the nests, roosts, and floors of the chicken houses with 10 per cent DDT dust will control the fleas, both free in the house and on the chickens themselves. It does not appear necessary to dust the chickens directly.

PAVLOVSKIĬ, E. N. (1946.) [The dynamics of blood-sucking diptera and methods and importance of its study.]—*Bull. Acad. Sci. URSS Sér. biol.* 1946. No. 2-3. pp. 211-232. [In Russian : English summary.] [Abst. from abst. in *Rev. appl. Ent.* Ser. B. 35. 140. (1947).] 1546

The author emphasizes the necessity of using quantitative methods for studying the specific composition and daily or seasonal frequency of the blood-sucking Diptera that attack man and domestic animals in the Soviet Union, particularly those that transmit disease. He reviews the methods that have been employed by different workers there and the results obtained, and considers that the best results are given by collecting the insects that settle on a man sitting unprotected in the open air for periods of 20 minutes at various times of the day, and by collecting those that are enclosed when a bell-shaped cover is lowered over

a man wearing protective clothing and sitting in the open. The latter method is well adapted for use at night.

BROWN, A. W. A., ROBINSON, D. B. W., HURTIG, H., & WENNER, B. J. (1948.) **Toxicity of selected organic compounds to insects. Part I. Tests for general toxicity on larvae of *Musca*, *Tribolium*, and *Ephestia*, and adults of *Sitophilus*.**—*Canad. j. Res. Sect. D.* 26. 177-187. 1547

The authors tested 127 synthetic organic compounds against the insects indicated in the title. It was found that gammexane and "chlor-dane" [the Technical 1068 of the Velsicol Corporation] were the most toxic compounds for the test insects, having twice the lethal effect of D.D.T.

Hexachloropropene, hexachlorobutadiene, symmetric heptachloropropane and asymmetric heptachloropropane, were four chlorinated hydrocarbons having a high toxicity, which was related to their fumigant action. Benzyl thiocyanate and its chlorinated derivatives were highly toxic. Some aromatic semicarbazones and some derivatives of morpholine were not very effective.

—W. E. SWALES.

TWINN, C. R., HOCKING, B., McDUFFIE, W. C., & CROSS, H. F. (1948.) **A preliminary account of the biting flies at Churchill, Manitoba.**—*Canad. j. Res. Sect. D.* 26. 334-357. 1548

The authors recorded the occurrence of five genera and 11 species of Culicidae, two genera and 12 species of Simuliidae (three and perhaps four of which may be new) and two genera and ten species of Tabanidae. Data were given on their habitats, life histories, habits, species association, and relative abundance and distribution. Mention was made on the status as pests of these insects and their influence on human activities in the locality. Evidence was presented that female mosquitoes feed on nectar and are efficient pollinators of northern orchids.—P. J. G. PLUMMER.

I. GRAHAM, N. P. H., JOHNSTONE, I. L., & RICHES, J. L. (1947.) **Studies on fly strike in merino sheep. No. 7. The effect of tail-length on susceptibility to fly strike in ewes.**—*Aust. vet. j.* 23. 31-37. 1549

II. GRAHAM, N. P. H., & JOHNSTONE, I. L. (1947.) **Studies on fly strike in merino sheep. No. 8. A surgical operation for the control of tail strike.**—*Ibid.* 59-65. 1550

I. Continuing the studies previously noted [*V. B.* 9. 782; 12. 33; & 13. 357] the authors conducted a number of field trials under a variety of conditions in Queensland and New South Wales, using some thousands of sheep. Tails

docked medium-long, to such a length that the tip of the tail lay about half an inch below the tip of the vulva, gave the lowest incidence of fly-strike. There was less urine staining about the tail and crutch and the sheep with tails of this length were less susceptible both to strikes in the docking wounds as well as to crutch and tail strikes occurring subsequently. The only disadvantage of the medium-long tail was a tendency to an increased "dagginess" (collection of faecal material in the wool on the tail).

II. As a result of the virtual elimination of crutch strike in sheep treated by the modified Mules operation the incidence of tail strikes has become more apparent. An operation is described and illustrated which stretches the bare skin from the ventral surface of the tail to cover the sides and end of the tail, thereby practically eliminating the occurrence of areas suitable for development of fly strike in this region.—H. McL. GORDON.

WATERHOUSE, D. F. (1947.) **The relative importance of live sheep and of carrion as breeding grounds for the Australian sheep fly *Lucilia cuprina*.**—*Bull. Coun. sci. industr. Res. Aust.* No. 217. pp. 31. 1551

A comprehensive series of trials was carried out in which carcasses of sheep, lambs, hares, birds and lizards were exposed throughout a year in maggot-proof trays. The numbers and species of flies produced were recorded. Only six out of 27 carcasses of sheep produced *L. cuprina* and then only an average of four flies. The total number of flies per carcass varied from 109 to 66,979 (average 10,000), the vast majority being species which are not responsible for the initiation of fly strike on sheep.

Although *L. cuprina* lays its eggs on carrion, competition and lethal temperatures prevent all but a few of the larvae from completing development. Predators also destroy many larvae.

It is clear that carrion is a comparatively unfavourable environment for *L. cuprina*. On the other hand the living sheep is a particularly favourable environment and from 26 struck sheep an average of 1,220 flies of this species per strike was bred, forming 90% of the flies produced. On the living sheep *L. cuprina* does not meet the degree of competition present in carrion, temperature is more favourable and predators are unimportant.

The implications of these findings in control of fly strike are discussed. It is clear that attempts to control the *L. cuprina* population should be directed primarily against breeding on the sheep.

This bulletin contains a considerable amount of data on techniques, carcass temperatures, parasites and predators, seasonal abundance of *L. cuprina*, and details of a trapping trial carried

out in a region in which sheep and *L. cuprina* are not abundant.—H. McL. GORDON.

I & II. WATERHOUSE, D. F. (1947.) **Studies of the physiology and toxicology of blowflies. XII. The toxicity of DDT as a contact and stomach poison for larvae of *Lucilia cuprina*. XIII. Insectary tests of repellents for the Australian sheep blowfly *Lucilia cuprina*.**—*Bull. Coun. sci. industr. Res. Aust.* No. 218. pp. 30. 1552

I. Suspensions and emulsions of D.D.T. had no contact toxicity for *L. cuprina* prepupae and solutions in kerosene or alcohol were only slightly more toxic than the solvents alone. In stomach poison tests a concentration of 0.01% in the medium retarded growth to about half size, while 0.03% inhibited it completely. D.D.T. is about 50 times more toxic than boric acid and ten times more toxic than sodium arsenite.

II. A number of repellents were tested under insectary conditions by applications in a ring round a cotton wool plug soaked in an attractant (indole, ammonium carbonate and ethyl alcohol). Ceylon citronella oil was repellent but the Java oil was not. The oil was fractionated and a highly repellent fraction isolated but not identified. One of the constituents, geraniol, is not repellent, while another, citronellal, is attractive.

Oils of *Zieria smithii* and *Dacrydium franklinii* (Huon pine) are repellent. Eucalyptus oils were not repellent and some were attractive. Other non-repellent oils were those of *Callitris glauca*, *Melaleuca* spp., *Eremophila mitchelli*, *Tagetes glandulifera*, *T. minima* and camphor. Chemically pure oleic acid was repellent but a commercial grade was not. Two preparations containing indalone were repellent as were also dimethyl phthalate and "612" (2-ethyl hexane 1,3-diol).

—H. McL. GORDON.

TATE, P. (1948.) **The technique for breeding pure-line cultures of the blow-fly (*Calliphora erythrocephala*).**—*Parasitology*. 39. 102-104. 1553

Care must be taken in breeding pure-line cultures of *C. erythrocephala* to ensure that there is no contamination from stray flies of the same or other species, since gravid females will oviposit at a distance from meat and the larvae crawl through minute openings (e.g., cotton wool or gauze) to reach food. A simple cage with perforated zinc sides and glass top is described. Uncontaminated eggs were ensured by first dipping the meat in boiling water and then placing it on a vessel standing over water. The pupae were kept in glass dishes with closely fitting covers to prevent parasitism by hymenoptera.—B. A. T.

BARANOV, N. (1941.) **Drugi prilozhnik poznavanju**

roda Sarcophaga (s.l.). [Second communication concerning the genus *Sarcophaga*.]—*Vet. Arhiv.* 11. 861-404. [Abst. from German summary.] 1554

B.'s first communication on the same subject (1929) was provoked by Enderlein's Classification (1928), in which the existing grouping and knowledge of the species of *Sarcophaga* was revised. He now discusses the subject of Rohdendorf's Classification (1937). He states that R. made great use of the morphology of the male genitalia for purposes of classification. B. made a parallel study of the terminalia of the female and describes the observations he made.—F. E. W.

O'DONOGHUE, J. G. (1949.) Report of flesh flies in mink in Alberta.—*Canad. J. comp. Med.* 13. 8-6. 1555

In the Edmonton district in June, 1948, increased prevalence of *Wohlfahrtia* and *Sarcophaga* species was noted. Young mink were chiefly affected, but adult females were also attacked. Animals affected were those in pens exposed to the sun. Nest boxes were sprayed outside with a D.D.T. insecticide and the larvae were removed by hand, using a local narcotic. Litters were examined once or twice daily without harmful results. Mortality was low except in one outbreak of rectal myiasis.—R. GWATKIN.

GASSNER, F. X., & JAMES, M. T. (1948.) The biology and control of the fox maggot, *Wohlfahrtia opaca* (Coq.).—*J. Parasit.* 34. 44-54. 1556

Reports from various parts of the U.S.A. and Canada indicate that there is a mortality of up to 30% among young foxes and mink due to myiasis caused by *Wohlfahrtia opaca*. The flies feed on flowers and other sweet materials during daylight hours, but find the darkness of the kennels no obstacle to larviposition. Usually only very young animals are parasitized, although adult animals weakened by disease may be attacked. If the infestation is heavy it may terminate fatally; 3-10% D.D.T. applied as a powder proves very effective in preventing myiasis in fox cubs.

—BERYL A. THURSTON.

STAGE, H. H. (1947.) DDT to control insects affecting man and animals in a tropical village.—*J. econ. Ent.* 40. 759-762. 1557

Two thousand two hundred pounds of a 50% D.D.T. wettable powder were used in an isolated bauxite mining village in Surinam, Dutch Guiana. A 2.5% D.D.T. water suspension was used to spray the 100 cattle and a few donkeys and as a dip for 90 dogs. All buildings were sprayed inside and out at the rate of one gal. of suspension to 300 sq. yd. This treatment was very effective against mosquitoes. Eleven months after treat-

ment 2,000 mosquitoes were liberated in S.'s house and eight hours later all were dead. A 5% D.D.T. solution in oil, used on a similar house, was not nearly so effective. Horn flies [*Siphona* (*Lyperosia*)], previously numerous in the dairy barns, were eliminated for ten months.

Boophilus annulatus microplus was reduced from 12 per cow to 1 per 60 cows after 11 treatments with the D.D.T. suspension at 30-day intervals. A 90% reduction in the cockroach population, lasting for ten months, was caused by 5% D.D.T. in oil treatment. *Argas persicus* and *Tunga* (*Sarcopsylla*) *penetrans*, the chigoe, were eradicated by the general spraying. The flea population on dogs, however, was not appreciably reduced by one dipping.—BERYL A. THURSTON.

NASH, T. A. M. (1948.) Tsetse flies in British West Africa. pp. 77. London: H.M. Stationery Office. 80s. 1558

This report presents a clear, yet detailed picture of the state of knowledge in 1945 of the bionomics and distribution of *Glossina* in West Africa. It forms the first real attempt to co-ordinate the mass of knowledge which has appeared in journals and official reports. Tours were made in 1945 and 1946 and the report is divided into sections dealing with Nigeria, the Gold Coast, Sierra Leone, the Gambia, and a final summarizing section on West Africa as a whole. A wide range of tsetse research is covered and suggestions for future research are given. One important feature of the work is the series of 15 large maps, showing the distribution of the various *Glossina* species, rainfall, population density, and the economic importance of tsetse flies.

Throughout West Africa, *G. longipalpis* and *G. morsitans* are the greatest potential menaces to stock. Both of these species normally feed wholly or practically wholly on mammalian blood. *G. tachinoides* and *G. palpalis*, whilst they can subsist on man and other mammals, normally take a proportion of non-mammalian blood, chiefly reptilian.

Of the various breeds of West African cattle the hump-backed zebu is the largest, and therefore the most desirable to keep as stock, but unfortunately it is the least resistant to trypanosomiasis and can never live in *G. morsitans* areas. The indigenous dwarf and N'dama cattle have a high tolerance to trypanosomiasis but there are areas where even they cannot withstand the tsetse. The economic importance of tsetse flies is emphasized by the following figures taken from the report:—

In Nigeria, seven and a half times the size of England, 79% of the area is infected with tsetse. Endemic sleeping sickness areas cover 30% and zebu cattle are free from trypanosomiasis in only 21% of the country. In the Gold Coast, one-

quarter the size of Nigeria, tsetse occur throughout the country; endemic sleeping sickness areas make up 37% and apart from two very small areas zebu cattle cannot be kept in the country. Sierra Leone is fortunate in that *G. morsitans* is absent and *G. longipalpis* is confined to a small area, thus bovine trypanosomiasis is not a serious problem. In the Gambia, in spite of the presence of *G. morsitans*, the local cattle have considerable resistance to trypanosomiasis and N. suggests that *G. morsitans* probably feeds on baboons which are less heavily infected with trypanosomes than are their normal hosts, the wild game.—J. B. CRAGG.

SCHWETZ, J. (1946.) Sur la cause directe de la répartition des diverses espèces de tsé-tsés dans la même région. [The direct cause of the distribution of various *Glossina* species in the same region.]—*Bull. Soc. Path. exot.* 39. 367-372. 1559

The distribution of *Glossina* species in a single region (i.e., same geographical position, altitude and temperature) depends mainly on the vegetation. The hydrophilic species, namely, *G. palpalis*, *G. pallicera*, *G. newsteadi*, *G. fusca*, *G. nigrofusca*, *G. tabaniformis* and *G. schwetzi*, are found only in large forests bordering on water. The xerophilic species, namely, *G. morsitans*, *G. pallidipes* and *G. brevipalpis*, are found in regions of less dense vegetation, e.g., park-land or savannahs. —BERYL A. THURSTON.

TENDEIRO, J. (1947.) Estudo preliminar dos tabanídeos da Guiné Portuguesa. [A preliminary study of the Tabanids of Portuguese Guinea.]—*Bol. cultural Guiné port.* No. 6. 435-447. [Abst. in *Rev. appl. Ent. Ser. B.* 36. 73 (1948), copied *verbatim*.] 1560

A list is given of 14 species of tabanids, comprising nine of *Tabanus*, two of *Chrysops* and three of *Haematopota*, taken in recent surveys in Portuguese Guinea, together with notes on the morphology of the adults and references to the literature on the relation of some of them to diseases of man or animals in other parts of Africa.

SHANAHAN, G. J. (1946.) The control of sheep ked. (*Melophagus ovinus*.) Experiments with D.D.T. and "666". Used in a power spray unit.—*Agric. Gaz. N.S.W.* 57. 632-635. 1561

Tests of the efficiency of D.D.T. and "666" (γ -isomer of hexachlorocyclohexane) against *M. ovinus* are described. The insecticides were applied by means of a power spray (shower dip) unit which is illustrated, the spray drained from the sheep being circulated and used again. There was a progressive decrease in the concentration of the insecticides as the number of sheep sprayed increased. The concentrations used, 0.025, 0.05 and 0.075% D.D.T. emulsions, and 0.01%

γ -isomer of hexachlorocyclohexane emulsion were effective in reducing the adult ked population within 24 hours. Twenty-eight days after the initial treatment, recently dead keds were found on sheep sprayed with both insecticides, indicating that there had been some residual toxicity. None of the treatments resulted in eradication of keds.

—H. McL. GORDON.

TAYLOR, F. H., & MURRAY, R. E. (1946.) Spiders, ticks and mites, including the species harmful to man in Australia and New Guinea. Service Publication. No. 6. (Aust. Sch. Publ. Hlth Trop. Med.) pp. 275. 1562

T. describes a number of ticks, spiders and mites which may attack man and animals in Australia and New Guinea. There are many line illustrations and keys are provided for a number of genera. Among the mites are the Tyroglyphidae, Dermanyssidae, Demodicidae, Tarsoneimidae, Sarcoptidae, Trombiculidae (with a key to the larval trombiculinae).

M. provides clinical notes on the effects on man of spider bites (*Latrodectus hasseltii* and *Atrax* spp.), tick paralysis (*Ixodes holocyclus*), bites of *Ornithodoros gurneyi*, irritation by mites (*Sarcoptes scabiei*, *Tyroglyphus longior*, *Pediculoides ventricosus*, *Dermanyssus gallinae*, *Liponyssus bursa*, *L. bacoti*) and trombiculid mites. There are brief notes on mites as internal parasites of man and mites as vectors of disease.—H. McL. GORDON.

STELLA, E. (1940.) Nuovi dati sugli ixodidi dell'Africa Orientale Italiana. [New data on the ticks of Italian East Africa.]—*Riv. Biol. colon.* 3. [Abst. in *Rev. appl. Ent. Ser. B.* 36. 24. (1948), copied *verbatim*.] 1563

A revised list is given of 48 species and varieties of ticks that have been recorded from Abyssinia, Eritrea, Somalia or British or French Somaliland, showing the districts in which they have been found, together with notes on their relative abundance and the diseases they are known to transmit to man or domestic animals.

GRANETT, P., & SACKTOR, B. (1947.) Testing tick repellents and observations of phototropic effects.—*J. econ. Ent.* 40. 259-263. 1564

Five nymphs of *Amblyomma americanum* were placed on untreated filter paper and were surrounded by a circle composed on the one side of a 5% solution of the chemical to be tested in a 1% solution of sodium oleate, and on the other side by a 1% solution of sodium oleate, these solutions thus being adjacent to but not touching the ticks. The number of crossings into each half of the surrounding area was observed for five min. Since the nymphs appeared to be affected also by the intensity of the light, experiments were made where the two halves of the paper had been

similarly treated with sodium oleate but had a 10 foot-candle difference in illumination. The ticks crossed more frequently to the side which was more brightly illuminated, each foot-candle difference in illumination resulting in an approximately 2% increase in attractiveness. A chemical which proved repellent under even illumination could be rendered neutral and even attractive by increasing the illumination on that side.—B. A. T.

ARTHUR, D. R., & EDWARDS, E. E. (1946.) **A note on the unusual male tick from Glamorgan.**—*Parasitology*. 37. 152–153. 1565

During investigations on *Ixodes ricinus* L. in S. Wales, a single male tick, which was found to be a member of the Ixodoidea, but which differed from the normal male of *I. ricinus* L., was recovered from Margam Moors, Glamorgan. It would not mate with unfed females of *I. ricinus*. A description of the tick is given.—B. A. THURSTON.

ARTHUR, D. R. (1946.) **The feeding mechanism of *Ixodes ricinus* L.**—*Parasitology*. 37. 154–162. 1566

The structure of the capitulum of *Ixodes ricinus* L. is described, particular emphasis being laid on a stylet-like process which effects closure of the pharyngeal orifice during contraction of the pharynx and so prevents the reflux of blood into the wound. It is attached to the hypostome and is continued posteriorly as a distensible pouch overlying the pharynx. It is supported by a ventral sclerotized rod. Similar structures have been observed by SAN (1935) in three other species of Ixodid ticks.—BERYL A. THURSTON.

COBBETT, N. G. (1948.) **DDT and DDT combined with benzene hexachloride for the control and eradication of *Boophilus annulatus*.**—*Amer. J. vet. Res.* 9. 270–276. 1567

Boophilus annulatus has been practically eliminated from stock in the southern part of the U.S.A. by the use of arsenic dips at fortnightly intervals. In Mexico, no serious attempt has been made to exterminate the tick and it is now a serious menace to the cattle industry in the U.S.A. From tests carried out in Mexico it was found that 1.0–3.0% D.D.T., 0.5–1.0% benzene hexachloride or 0.5–1.0% each of D.D.T. and benzene hexachloride will kill practically all the attached ticks on cattle and prevent re-infestation for at least two weeks. A great deal of experimental evidence is presented in support of this statement, and C. considers that grounds exist for supplanting arsenic with D.D.T.—benzene hexachloride dips.

—G. B. S. HEATH.

ADLER, S., & FELDMAN-MUEHSAM, B. (1948.) **A note on the genus *Hyalomma* Koch in Palestine.**—*Parasitology*. 39. 95–101. 1568

The diagnosis of species of *Hyalomma* has

been found extremely difficult owing to the wide variation within the species. A single female gave rise to progeny which varied in leg colour, in shape and size and in other features. The most useful diagnostic characteristics were found to be the shape and size of the female genital aperture, the cuticle in the vicinity of the stigmata, and the longitudinal “ducts” in the anterior border of the scutum. A key to the Palestine forms is given.

—BERYL A. THURSTON.

GALUZO, I. G. (1944.) [Ecological foundations of control measures against transmitter of haemosporidiasis of horses—the tick *Dermacentor marginatus*.]—*Izv. kazakhsk. Fil. Akad. Nauk SSSR (Ser. zool.)*. No. 3. p. 182. [In Russian.] [Abst. in *Rev. appl. Ent. Ser. B.* 35. 160. (1947), copied *verbatim*.] 1569

On the basis of observations in 1940 and 1941 on the bionomics and ecology of *Dermacentor marginatus*, Sulz., in Kazakhstan, the author recommends measures for the control of this tick and the protection of horses from infestation. They comprise agricultural measures designed to destroy the eggs, engorged larvae and nymphs on pastures, such as mowing and the subsequent removal of the hay, ploughing strips of soil along roads and fields, destroying dense growths of weeds near irrigation ditches, and sowing fodder grasses in pastures; cleanliness in stables and yards, to prevent the ticks from developing in straw and dung; the destruction of small rodents, which serve as hosts for the ticks and carry them from place to place; and protecting horses from infestation in the field by keeping them away from the margins of roads or fields and other places covered with shrubby vegetation, where the ticks concentrate. These measures should be supplemented by chemical treatment of infested animals.

SKRUINNIK, A. N., & RUIZHOV, N. V. (1941.) [Experimental investigation on the ticks, *Dermacentor silvarum* Ol., as the vectors of spring - summer encephalitis.]—*Trav. Acad. milit. Méd. Kiroff Armée Rouge*. 25. 41–49. [English summary.] [Abst. in *Rev. appl. Ent. Ser. B.* 34. 69. (1946), copied *verbatim*.] 1570

A detailed account is given of the experiments in the Province of Khabarovsk (Russian Far East) in 1937–38 in which it was shown that the virus of spring-summer encephalitis persists in *Dermacentor silvarum*, Olen., from stage to stage and from generation to generation. *D. silvarum*, *Haemaphysalis concinna*, Koch, and *Ixodes persulcatus*, Schulze, represented 50, 37 and 13 per cent., respectively, of the ticks on cattle, 65, 28 and 7 per cent. of those on horses, 0.5, 79.5 and 20 per cent. of those on dogs, and 8, 12 and 80 per cent. of those collected from muslin drags and clothing.

D. silvarum was most abundant in the second half of May and almost disappeared at the beginning of July.

O'DONNELL, J. M. (1946.) **An observation on the habits of *Acarus scabiei*.** [Correspondence.]—*Med. J. Aust.* August 17th. 250-251. 1571

The finding of a male and female acarid "locked together" in a new scabietic non-pustular vesicle on the finger is described. There was no burrow and the vesicle was obviously a new lesion.—H. McL. GORDON.

KEMPER, H. E., ROBERTS, I. H., & PETERSON,

See also absts. 1533 (*Otobius megnini*); 1542 (in Australia); 1713 (animal parasites of animals and man); 1717 (mites associated with stored foods).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

PARANJAPÉ, K. D., PHALNIKAR, N. L., BHIDE, B. V., & NARGUND, K. S. (1945.) ***In vitro* observations on the anthelmintic action of some lactones and compounds allied to santonin.**—*J. Indian med Ass.* 14. 69-73. 1573

This study is concerned with the relation between chemical constitution and anthelmintic action. Apart from chemical composition, physical properties have also to be considered, such as solubility in water and lipoids, diffusion and absorption of the drug. The responsibility for anthelmintic action of a lactone group in the molecule of drugs like santonin is in some doubt, and the aim of the present work was to investigate this and similar questions. Since it is difficult to preserve parasitic worms in the living condition, earthworms and small fish were used. They were immersed in 0.02% solutions of the drug and the times were taken for cessation of activity and subsequent death. Drugs found to attack the skin of the worm were classed as likely to endanger the host. It is concluded that lactones having certain described chemical structures, e.g., butyrolactone, free phenolic groups in the benzene ring and certain dienones, are likely to prove useful as anthelmintics. These should now be subjected to *in vivo* tests and clinical trials.—F. C. MINETT.

BALDWIN, E. (1948.) **A study of anthelmintic potency in relation to chemical constitution.**—*Brit. J. Pharmacol.* 5. 91-107. 1574

Tests of about 200 synthetic compounds for nematocidal activity were carried out *in vitro* using *Ascaris* as the test subject by immersing it in solutions of the drugs and observing action on the neuro-muscular apparatus.

Santonin was used as a standard and several derivatives of it were tested, the conclusion being that these act by reversion to santonin itself in the test fluid. Of significance for activity were: an intact γ -lactone ring, a double bond at position 7 and an angular methyl group at position 10, all of these being required for anti-ascaris activity.

H. O. (1947.) **Hexachlorocyclohexane as an acaricide for the control of the spinose ear tick on cattle.**—*N. Amer. Vet.* 28. 665-668 & 672. 1572

In trials in New Mexico (U.S.A.) various preparations containing hexachlorocyclohexane effectively destroyed all larvae and nymphs of the spinose ear-tick, *Otobius (Ornithodoros) megnini*, in the ears of cattle. One preparation, consisting of 5% hexachlorocyclohexane (33% gamma isomer), 6% xylol and 91% pure pine oil prevented re-infestation for at least 17 days.—L. DAVIES.

Many aliphatic-aromatic ketones were tested, and the activity found in those resembled that of thymol and β naphthol. 2-hydroxydiphenyl carbamate was relatively highly active as also were 4-benzyl pyridine and 2,2'-dipyridyl phenanthroline. Many phenolic ureas, amidines and thiazoles were inert and antibiotics as a class were also inert. [Results of "critical tests" on santonin (*i.e.*, tests *in vivo*) reported by Hall (1918), Mote (1924) and Shillinger (1927) showed santonin to have only a low acaricidal value, ranging from 0-46%.—Ed.]—J. E.

ALICATA, J. E. (1948.) **Observations on parasites of domestic animals in Micronesia.**—*Pacific Sci.* 2. 65-66. [Abst. in *Helminth. Abstr.* 17. 15, copied verbatim.] 1575

The helminths of economic importance here reported from Micronesia are: *Fasciola hepatica* from cattle on Guam, with *Fossaria ollula* as the local intermediate host; *Stephanurus dentatus* and *Oesophagostomum dentatum* from pigs on Ponape and Guam, and *Metastrongylus elongatus* from pigs on Guam; *Tetrameres* sp., *Heterakis* spp. (probably *H. gallinae* and *H. lingnanensis*), *Amoebotaenia* sp. (probably *A. sphenoides*) and *Raillietina* sp. (probably *R. echinobothrida*) from chickens on Ponape; *Ancylostoma caninum* and *Dipylidium* sp. from a dog on Ponape.

EGEHØJ, J. (1948.) Bidrag til kendskabet om Distomatosen udbredelse og økonomiske betydning hos dansk slagtekvæg. [The extent of Distoma infestation among Danish slaughter cattle—economic significance.]—*Maanedsskr. Dyrlaeg.* 59. 454-457. 1576

Of 21,509 slaughtered animals (adult) 2,336 (10.9%) harboured the flukes. About 5.06 kg. (84.52%) of each attacked liver was rejected, giving an average loss of 0.55 kg. liver per slaughtered animal or 11,829.95 kg. liver in all. This represented a loss of 31,940.87 kr., or 1.49 kr. per slaughtered animal, or 13.67 kr. per animal affected. The disease is encountered to a great

extent in the region between the Limfjord and the German border of Denmark, and in cattle from mid-Jutland.—J. T. GREAVES.

OLSEN, O. W. (1946.) Hexachlorethane-bentonite suspension for the removal of the common liver fluke, *Fasciola hepatica*, from sheep.—*Amer. J. vet. Res.* 7. 358-364. 1577

The results of the treatment of sheep with hexachlorethane-bentonite suspension were assessed on the basis of egg counts made on individual faecal samples from 110 animals, post-treatment counts being made about two weeks after administration of the drug. In addition 20 P.M. examinations were made on treated sheep from 4-16 days after medication.

The suspension was made as an aqueous drench by mixing 500 g. of finely ground commercial hexachlorethane, 50 g. of bentonite, a small quantity of white flour and 750 ml. of tap water, thus producing a suspension having one part of hexachlorethane by weight to two parts of the mixture by volume.

The mixture proved to be effective for sheep and of 110 sheep, each of which was given 15 g. of hexachlorethane, 104 passed no fluke eggs in the faeces after a single treatment. Immature flukes were relatively resistant to the drug, which was tolerated in doses far in excess of those required to remove the adult flukes.—S. B. K.

OLSEN, O. W. (1948.) Wild rabbits as reservoir hosts of the common liver fluke, *Fasciola hepatica*, in Southern Texas.—*J. Parasit.* 34. 119-123. 1578

Wild rabbits play an important part in the epidemiology of liver fluke disease since they may act as reservoir hosts. This paper reviews some of the significant literature and reports the results obtained from P.M. examination of a large number of jack rabbits, *Lepus californicus merriami* and cotton-tails, *Sylvilagus floridanus* sub-sp.

In Europe, liver flukes were reported from the hare, *Lepus timidus*, as early as 1676, while Thomas, who in 1883 stated that the wild rabbit population near Oxford was practically decimated during the 1880 outbreak of fascioliasis in England, considered that extermination of liver flukes would be impossible as long as rabbits and hares were present in the infected areas.

In the present investigation 99 out of 309 jack rabbits and five out of 24 cotton-tails were found to be infested with flukes; fluke eggs taken from the gall bladders of both species were found to be fertile.

It is considered that rabbits and hares serve as a vast reservoir of infection, maintaining infection on unpastured areas and serving to intensify infection in areas where rabbits and stock both graze.—S. BRIAN KENDALL.

OLSEN, O. W. (1947.) Longevity of metacercariae of *Fasciola hepatica* on pastures in the upper coastal region of Texas and its relationship to liver fluke control.—*J. Parasit.* 33. 36-42. 1579

This paper presents the results of field observations designed to determine (a) whether pastures in the Gulf Coast region ever become free from the metacercariae of *F. hepatica*, (b) the periods of freedom, and (c) if such periods exist, whether they are sufficiently long to allow the development to full maturity of all immature flukes in the body of the mammalian host. Such mature flukes would be susceptible to drug therapy and it is apparent that information of this kind is basic to a programme of liver fluke control.

Longevity of the metacercariae was determined by the examination of faecal material from originally fluke-free sheep placed on the pastures at known intervals. The incubation period was assumed to be three months and the probable date of infection thus calculated. The results were compared with those obtained by P.M. examination of sheep which were exposed to infection at intervals for a month, after which they were fed under fluke-free conditions until young flukes could easily be identified. It was concluded that cercariae were shed generally during the winter and spring months when standing water was present on the pastures, being later destroyed by the unfavourable heat and drought of the early summer. The period between the time when the cysts are destroyed in the summer and the mass reinfection of the pastures after the onset of the winter rains is sufficiently long to allow young flukes to develop to maturity and hence become susceptible to drug therapy. Hence animals should be treated with carbon-tetrachloride or hexachlorethane in the late autumn just before the winter rains.—S. B. K.

LE ROUX, P. L. (1949.) Is cysticercosis bovis on the increase in this country?—*Vet. Rec.* 61. 87. 1580

The author draws attention to the fact that the incidence of *Taenia saginata* infestation in adults and children seems to be increasing in the United Kingdom and a plea is made for co-operation between those operating the National Health Service, veterinarians and the various Ministries concerned. Factors contributing to the present increase of infestation are discussed.

—D. LUKE.

ANON. (1948.) Control of trichinosis. Report by the Committee of Public Health Relations, The New York Academy of Medicine.—*Publ. Hlth Rep., Wash.* 63. 478-488. 1581

This report gives figures on the incidence of

human trichinosis in the U.S.A., and concludes therefrom that trichinosis is a significant public health and economic problem. The adequacy of present meat inspection regulations is questioned and three methods of control, *i.e.*, microscopic examination, boiling of garbage fed to pigs, and larvicidal processing of pork, are critically discussed. The first is considered inadequate, the second is recommended, estimates being given of the cost involved and the difficulties inherent in enforcing such a measure. Of the larvicidal treatments of pork, freezing is discussed at length; though the committee has been under the impression that rapid chilling might provide an effective control measure, refrigerating engineers from various meat packing companies have not supported this measure for trade reasons.

Specifically the committee recommends (1) that all pork from pigs fed on uncooked garbage be excluded from New York City, and that garbage from New York City be heated to destroy trichina; (2) that pigs awaiting slaughter in New York City should not be fed raw garbage; (3) strict enforcement of the Sanitary Code in the preparation of pork products; (4) particular vigilance in the processing of products to be eaten without cooking; (5) educational campaigns concerning trichinosis. The committee also recommends that stimulation be given to further research on effective ways of killing trichina in pork products.

—J. F. A. SPRENT.

EVELETH, D. F., & GOLDSBY, A. I. (1947.)
Parasitism in feeder lambs.—*Vet. Med.* 42.
209–215. 1582

Seventeen groups of 25 lambs each were given different anthelmintic treatments, and a further group of 25 untreated lambs was used. All the sheep were fed the same high grade diet. The group which received two doses of phenothiazine, copper sulphate and nicotine sulphate in the feed at a 21-day interval had the highest average gain per day (0.425 lb.), while the untreated lambs gained the least weight per day (0.266 lb.); difference between these gains was not statistically significant. Even in the most thrifty group, the lambs required 8.8 lb. of food for each lb. of gain in bodyweight, and this is too much for economical feeding of lambs. The authors conclude that factors other than parasitism may influence the rate of gain. This paper will repay study by those interested.—G. B. S. HEATH.

ANON. (1945.) Control of trichostrongylosis in sheep. The use of phenothiazine and tetrachlorethylene as substitutes for nicotine.—*Aust. vet. J.* 21. 116–119. 1583

Substitutes were needed because there were war-time shortages of certain anthelmintic drugs, notably nicotine sulphate.

The use of phenothiazine is described under preparation, dose rate, and administration with special reference to avoidance of staining of the fleece. A table of dose rates is given for use against trichostrongylosis. The doses recommended are larger than those usually prescribed for use against oesophagostomiasis.

The use of tetrachlorethylene is described, with special emphasis on the necessity for prior stimulation of the oesophageal groove reflex in order to ensure that the drug will be swallowed into the abomasum. It is not efficient if it is swallowed into the rumen.

Methods are described for the simultaneous or successive administration of copper sulphate solution (required to stimulate the oesophageal groove reflex) and tetrachlorethylene. The toxic hazards of the latter are discussed.—H. McL. G. WHITTEN, L. K. (1948.) The anthelmintic efficiency of phenothiazine sulphoxide against *Haemonchus contortus* and certain large bowel parasites of sheep.—*Aust. vet. J.* 24. 114–115. 1584

Phenothiazine sulphoxide is the chief oxidation product of phenothiazine in the ruminant and it was thought that it might be responsible for the anthelmintic efficiency of the drug.

A series of tests were carried out against *H. contortus* using egg counts to assess efficiency. Efficiency increased with increasing doses from no reduction in egg count for 2 g. doses to over 90% reduction for 10–15 g. doses.

A limited number of tests against *Chabertia ovina*, *Oesophagostomum venulosum* and *Trichuris ovis* indicated anthelmintic effects similar to those of phenothiazine. The sulphoxide is the first phenothiazine derivative to show anthelmintic effects similar to those of the parent compound. There was no indication that the efficiency of phenothiazine depends upon the sulphoxide. The doses of the latter required to give marked anthelmintic effect were of the same order as those of phenothiazine itself. The sulphoxide has no advantages over phenothiazine as an anthelmintic, and it certainly has greater toxic hazards [see p. 361, abstr. 1620].—H. McL. GORDON.

FALLIS, A. M. (1948.) *Ascaris lumbricoides* infection in guinea pigs with special reference to eosinophilia and resistance.—*Canad. J. Res. Sec. D.* 26. 307–327. 1585

Ascaris infection in g. pigs was associated with loss in weight and congestion of the lungs, but no fever. Eosinophilia occurred and was increased with repeated infection. Reinfection resistance was observed to occur and was maintained for at least 15 weeks. Injection of serum and liver preparations from infected animals caused slight resistance in uninfected animals as judged by the

degree of lung damage and the number and size of larvae, and the author considered that resistance to the larvae was active before they reached the lungs and to some extent before they reached the liver.—J. F. A. SPRENT.

TOOP, C. R. (1947.) Sodium fluoride for the treatment of worms in pigs.—*J. Agric. W. Aust.* 24. 216-219. 1586

T. discusses the use of sodium fluoride for treatment of ascariasis in Western Australia. The greater part of the information given had already been published [see *V. B.* 18. 386].—H. McL. G.

MORGAN, B. B., & GRUMMER, R. H. (1947.) The efficacy of sodium fluoride for light infections of swine ascarids.—*N. Amer. Vet.* 28. 669-672. 1587

In trials with sodium fluoride against *Ascaris suis*, 30 naturally infected pigs were divided into three groups of ten, all fed an adequate diet. Groups (I) and (II) were given 1% sodium fluoride mixed with the food, the pigs in group (I) getting 5 lb., of food individually and those of group (II) 50 lb., in a communal trough. Group

See also absts. 1542 (in Australia); 1642 (cysticercosis); 1654 (liver fluke); 1713 (animal parasites of animals and man).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

OLSON, C. (1948.) Equine sarcoid, a cutaneous neoplasm.—*Amer. J. vet. Res.* 9. 933-941. 1588

Two cases of equine sarcoid are described. The tumours consisted principally of fibroblasts in variable degrees of density. The amount of intercellular substance varied from area to area. Many fibroblasts were anaplastic. The tumour was, in one case, successfully autotransplanted by means of a tissue suspension inoculated on scarified skin.—A. R. JENNINGS.

VEENENDAAL, H. (1948.) Behandeling van papillomen van het mondslijmvlies bij honden met colchicine. [Treatment of papilloma of the mucous membrane of the mouth in dogs with colchicine].—*Tijdschr. Diergeneesk.* 73. 211-217. [English summary slightly amended.] 1589

Good results with dogs suffering from papillomatosis of the oral mucous membrane, are stated to have been obtained with sub-cutaneous injections of colchicine solutions.

ANON. (1948.) The program of the National Cancer Institute.—*Publ. Hlth Rep., Wash.* 63. 501-517. 1590

The Institute, founded with the National Advisory Cancer Council, U.S.A., by Act of 1937, and reorganized in 1947, undertakes activities in three main branches. Firstly, Institute cancer

(III) served as a control. Half the food was given in the morning and half in the afternoon and any food left over was removed after 24 hours.

For ten days following treatment, the faeces were examined frequently. The animals were then killed; fluorine analysis and histological examination were made of intestine, liver, kidney, uterus, muscle and rib tissues. The greatest amount of fluorine consumed by any one pig was 22.68 g. There were no significant changes in the tissues and no lesions were observed. In group (I), 92 ascarids were expelled following treatment, and 11 were recovered P.M. giving 89% efficiency; in group (II), 33 ascarids were expelled with 100% efficiency and in group (III), 38 ascarids were recovered P.M. Sodium fluoride made the food less palatable and lowered food consumption, but the daily weight gains for the three groups were considered normal. The drug must be thoroughly mixed in dry feed; in liquid food it may sediment and the safety margin is small. A few thorny-headed worms (*Macracanthorhynchus hirudinaceus*) were not removed by the treatment.—G. M. U.

research is carried out in the fields of biology, biochemistry, chemotherapy, biophysics, endocrinology, pathology, biostatistics, experimental oncology and clinical research. Secondly, grants support cancer research in outside laboratories, and research fellowships are awarded. Thirdly, a cancer control programme is carried on, including grants to state health agencies and other agencies and institutions for the initiation or expansion of their own control programmes, grants to medical and dental schools, specialized training, educational, consultant and advisory services, and loans of radium and personnel.

—E. COTCHIN.

CONNELL, H. G., MUNRO, L. A., & MEDLEY, A. (1946.) Restropin factor in cancer in relation to the reticulo-endothelial system.—*Canad. med. Ass. J.* 54. 161-164. 1591

It has been suggested by different workers that resistance and immunity are centred in the reticulo-endothelial system (R.E.S.). The activity of the system is indicated by its special affinity for certain colloidal dyes, such as congo red, when injected into the blood stream. Some workers have found impairment of the R.E.S. in cancer as shown by congo red index determinations. The Wetzler-Legetti & Wiesner method was employed to test blood samples from 103 cancer patients. 48% gave a negative result, 84% were

positive and 18% were neutral in reaction. It is believed that the congo red index of the patient is the better test in judging the state of the R.E.S. as an aid in prognosis.—P. J. G. PLUMMER.

ZAHL, P. A., & DRASHER, M. L. (1947.) **Distribution and growth-potency of cells in a transplantable sarcoma.**—*Cancer Res.* 7. 658–666. [Authors' summary copied *verbatim*.] 1592

Mouse tumor cell suspensions prepared by the use of a maceration technic have been studied. It is found that such freshly prepared and unstained suspensions contain a cell population of two distinguishable classes, which have been designated as *viable* and *necrotic*. The viable cells may be further subdivided as to type. The proportion of viable and necrotic cells in suspensions made from whole tumors is found to vary regularly and significantly as a function of the age of the tumor, in the range of 2 to 14 days. Suspensions from very young tumors (removed 2 to 3 days after implantation) are high in necrotic cells and low in viable cells. The same condition applies to suspensions from old tumors (removed 10 to 14 days after implantation). In suspensions from tumors removed 5 to 8 days after implantation, the viable cells are by far the most numerous.

The central core of the tumor (*i.e.*, the implanted fragment) does not appear to change appreciably in size or shape from the time of implantation to about the tenth day. During the period between implantation and 10 to 12 days the cell distribution in the core tissue does not change significantly, a high and constant level of necrotic cells being found. The intermediate tissue zone is relatively high in viable cells during the 6-to-10-day period, high in necrotic cells thereafter. The peripheral tissue zone is high in viable cells from the second to the tenth day, thereafter becoming high in necrotic cells.

A technic is described for preparing cell suspensions of known cell number and cell type, which when implanted will give fairly predictable tumor growth rates.

The weight of the inoculated tumor after 7 days of growth varies as a function of the number of viable cells introduced. The smallest number of mouse sarcoma 180 cells producing a weighable tumor after 7 days of growth is of the order of 20,000, although inocula containing fewer cells may produce tumors if allowed to remain in the mouse for a longer period of time. The proportion of takes increases as a function of the number of cells introduced, within a specified range.

NUTRITIONAL AND METABOLIC DISORDERS

RUSSELL, F. C. (1948.) **Diet in relation to reproduction and the viability of the young. Part I. Rats and other laboratory animals.**—*Tech. Comm. Com. Bur. Anim. Nutrit.* No. 16. pp. 98. Bucksburn, Aberdeen: The Bureau. 6s. 1593

In the foreword by Leitch, it is stated that 15 years ago the known causes of types of sterility in dairy cows were reviewed [LEITCH, I. (1933.)—*Nutr. Abstr. Rev.* II. 451–459.] and that “the performance of dairy herds has not improved in the interval”. This is a challenging statement which merits very serious consideration. It is not made in respect of dairy herds in any particular country but presumably applies to dairy cattle throughout the world. In the last 15 years there have been advances in knowledge of nutrition, of breeding, of techniques of management and of treatment of the main diseases which reduce the efficiency of dairy cows. If, in spite of these advances, the nett result is that performance has not improved then it would appear that the knowledge gained is not being applied in practice, either because it has not yet reached the farmer or, which seems more probable, because economic factors hinder its application. Because of this lack of improvement it was planned to survey the position again and to extend the review to cover all worth-while

information regarding all classes of farm stock. As, however, it was difficult to find records it was decided to start by reviewing experiments on laboratory animals in the hope that they might serve as a guide.

The present review is the result and it deals with the dietary requirements of laboratory animals for reproduction and lactation. The literature which has been consulted covers the period 1931–47 with a few of the more important papers of 1948.

Stock diets which have given satisfactory results with various types of laboratory animals are briefly described. The difficulty of comparing results obtained by different workers using the same diets is pointed out where non-dietary factors are not strictly controlled. Food consumption, energy requirements, proteins and carbohydrates and their effects on reproduction and lactation are then dealt with. Each of the mineral constituents is also considered separately.

This is followed by sections on the fatty acids and fats, vitamins A, E, K, C and the B complex. There is a short summary and a good bibliography.

Throughout the work tables and graphs have been used freely to summarize results. A great volume of material has been dealt with and the complexity of the subject makes abstracting difficult.

In the section dealing with vitamin K, the existence of a factor or factors in fresh grass essential to fertility in rabbits is mentioned. It is not identical with vitamin A, D or E, nor is it supplied by dried yeast. The nature of this "factor" is not known, the possibility of its relationship to the "oestrogenic factor" in subterranean clover suggests itself. The molybdenum and cobalt requirements of laboratory animals have apparently not been studied.

Low protein in the rations of dairy cows has not infrequently been suggested as a cause of low fertility, evidence derived from laboratory animals seems to be conflicting. Some workers report that rabbits on a diet containing only 2% protein had normal oestrus and ovulation, while in rats as much as 18% protein may be inadequate when the sole source of protein was wheat gliadin. It would also appear that the level of protein necessary to maintain fertility may be higher in the male than in the female. While a high level of protein gives best results during suckling it may, in rats, adversely affect reproduction by increasing sterility, delaying the birth of the first litter, shortening the breeding period and reducing the number of young and the number of litters. If these findings should apply to cows the dairyman is faced with a dilemma in his attempt to maintain maximum milk production and, at the same time, a high level of fertility.

The review is of direct value and interest to all workers who use laboratory animals and in addition will interest those workers who are concerned with the problems of reproduction and lactation in the larger animals.—M. C.

HAMMOND, J. (1944.) *Nutrition in pregnancy. Physiological factors affecting birth weight.*—*Proc. Nutr. Soc.* 2. 8-12. Discussion pp. 12-14. 1594

H. suggests that the nutrients of a mother's blood are partitioned to various tissues in accordance with the metabolic rate of the cells of each tissue. The foetus is classed as a tissue with a high metabolic rate comparable with that of the maternal central nervous system.

The size of the offspring at birth is related to the size of the dam and H. suggests that such effects are due to competition for nutrients between mother and foetus. A small mother would have a relatively high metabolic rate to the disadvantage of the foetus. Similarly, the metabolic rate of an immature dam would be high and would adversely affect the foetus.

The size of individuals when born is inversely related to the number in the litter. This is shown to be unrelated to limitation of uterine space; nor is it simply a question of inadequate maternal diet. H. suggests that a key growth substance of

maternal origin circulates during pregnancy. The foetuses compete for this factor, and in large litters each foetus gets relatively little.

At the latter part of pregnancy if maternal diet is inadequate the weight of a ewe will fall before that of its lamb and twin lamb foetuses are less likely to maintain their growth rates than singles. Ewes carrying twin lambs are more susceptible to starvation (as in twin lamb disease) than those with singles.

The various foetal tissues compete amongst themselves. If nutrients are deficient the foetal functions most likely to suffer are those acquired late. Inadequate diet in pregnancy may result in lack of vitality in the young and may so affect the muscle of the reproductive tract of the dam as to make parturition difficult.

In the discussion BARCROFT reported that in goats the metabolic rates of certain foetal tissues are higher than for the corresponding maternal tissues. KESTNER stated that in kittens and puppies at birth heat regulation and O₂ consumption are well developed in litters of up to two, but are inadequate in litters of four or five. NEWTON reported his findings that true maternal growth in pregnancy was not abolished by surgical removal of the foetuses only (in mice); but was dramatically abolished by removal of the placenta. A growth factor from the placenta is suggested. H., however, considers this effect to be due to placental progesterone and oestrin.—R. J. F.

DESAI, S. V., & MATHUR, M. L. (1945.) *Preliminary studies on calcium and phosphorus in milk and feeds of Sahiwal cows.*—*Indian J. vet. Sci.* 15. 198-219. 1595

The results of experiments on Sahiwal cows are given in tables and as graphs. In individual cows there was no variation in the percentages of Ca and P in the milk at different milkings on the same day.

Within a period of four weeks there was practically no variation in the percentages of Ca or P, except in the milk of cows collected before calving (pre-milkers) and in those at or past the peak yield. During the peak period the percentage of Ca and P decreased; later it increased. In milk collected before calving (pre-milk) Ca was low and P high, the ratio being at first 1:3.64. After a week or two the percentages tended to become stabilized. The Ca:P ratio varied in different cows.—F. C. MINETT.

SMITH, V. R., NIEDERMEIER, R. P., & HANSEN, R. G. (1948.) *Parturient paresis. II. The effect of partial versus complete milking upon the total blood serum calcium of dairy cows at parturition.*—*J. Dairy Sci.* 31. 173-177. 1596

The complete milking of cows immediately

following parturition did not increase the incidence of parturient paresis nor was the average total serum calcium greatly different for two groups of cows, one partially and the other completely milked.

Determinations for total blood serum calcium were made on samples of blood collected daily from 27 cows of the completely milked group and 29 cows of the partially milked group for five days prior to the anticipated day of parturition and for five days following calving.

Two cows had mild symptoms and three had parturient paresis in the completely milked group. Eight cows in the partially milked group had parturient paresis. All cases of parturient paresis occurred in the Jersey breed.—G. SHEARER.

ROBERTSON, A., BURGESS, J. W., MARR, A., & MILNE, B. J. C. (1948.) **Some observations on milk fever.**—*Vet. Rec.* 60. 505-508. 1597

From a study of 25 cases of milk fever it was found that while the evidence from those responding normally to calcium therapy may appear conflicting, six out of seven cases which did not respond support the theory that hypophosphataemia is a complicating factor.

A dairy farmer had lost four cows from milk fever in succession through failure to respond to repeated subcutaneous injections of calcium borogluconate. Two others, also treated with calcium borogluconate, recovered in from 5-10 min. after inflation of the udder with air. From the chemical examination of blood samples of one of these it was found that the inorganic phosphorus fell to below 1 mg. per 100 ml., rising slowly after the calcium injection, and much more rapidly following inflation.

In another cow the blood had abnormally low calcium and phosphorus values but the cow, while remaining outwardly normal till nine days after calving, was then unable to stand. It was treated by inflation only, and in the blood samples examined there was a rapid rise of both calcium and phosphorus.

One other cow with a history of difficulty in rising before calving went down after calving and did not respond to borogluconate treatment but two hours after inflation rose on stimulation. The blood of this cow had an abnormally low inorganic phosphorus value even when the animal was able to rise.

The findings in 17 cases responding normally are summarized. In nearly all these cases the inorganic phosphorus value of the blood was low during milk fever. Immediately following treatment there was an increase in phosphorus in at least 12 cases, and those animals from which blood samples were obtained after recovery had on an average a 70 % increase.

Histories are given of four cases which did not respond so favourably to calcium therapy; it was found that no relapses occurred after the inorganic phosphorus levels had risen.—J. O. L. K. BOOTH, A. N., ELVEHJEM, C. A., & HART, E. B. (1947.) **Some effects of feeding iodinated casein to dairy cows.**—*J. Dairy Sci.* 30. 448-455. 1598

Feeding 15 g. daily of iodinated casein to dairy cows resulted in conspicuous increases in milk and butter fat yield over a 6-15-week period, after which, whether dosage with the drug was continued or not, a sharp fall in production was observed below the normal levels to be expected for the stage of lactation. There were also notable decreases in body weight and heart rates were accelerated. In hot weather, while the increase in milk production was less marked, the deleterious effect on the well-being of the cows was more noticeable. Use of the substance in dairy practice should therefore be made with care. On analysis of the milk, results indicated that there was a marked decrease in vitamin C and in urea nitrogen, but other nitrogenous fractions were less affected. Animals which, by virtue of large size or advanced age, might be expected to have a low natural thyroxin secretion, appeared to respond more to iodinated casein than smaller or younger animals.—R. MARSHALL.

VOSS, R. C. (1949.) **Trace elements and animal health.**—*Vet. Rec.* 61. 39-40. 1599

The most important of these elements in Scotland is cobalt. It has great importance in pasture and pasture soils. Cobalt deficiency in pasture leads to pining in stock. Recently TOSIC & MITCHELL (1948) have shown that the bacterial fraction isolated from the rumen has a much higher concentration of cobalt than the rest of the rumen contents. It was found recently also that the pure anti-pernicious anaemia factor is an organic compound containing 4 % cobalt.

Another trace element is, copper which is associated with swayback in sheep and liming as with cobalt depresses the availability of copper, swayback being more prevalent in limestone areas.

In treatment of pine, administration of cobalt *per os* was more successful than by injection which indicated that the bacteria of the rumen are associated with the function of cobalt.—G. S.

I & II. MARSTON, H. R., LEE, H. J., & McDONALD, I. W. (1948.) **Cobalt and copper in the nutrition of sheep.**—*J. Agric. Sci.* 38. 216-221; & 222-228. 1600

I. Sheep kept on the shell sand littoral of South Australia develop "Coast disease" which is characterized by retarded growth, lethargy, a progressive aplastic anaemia, and a greenish-hued fragile skin.

Administration of cobalt alone resulted in animals kept on this land developing chronic copper deficiency: the administration of copper alone did not prevent the animal "pining" and dying within a year. Administration of both cobalt and copper produced apparently normal healthy sheep.

The symptoms of copper deficiency in sheep were: spastic diplegia—in our animals—with degenerative lesions in brain and spinal cord similar to those changes seen in lambs borne by ewes with copper deficiency; haemosiderosis and anaemia, which in extreme cases is of a macrocytic, hypochromic nature; and obvious changes in the fleece.

II. Cobalt and copper were given to different groups of hoggets on coastal regions of South Australia. These groups were given either cobalt or copper, or both together, the amount of copper given being different in different groups.

All animals that received no cobalt had typical symptoms of cobalt deficiency and most died within a year. The administration of 10 mg. copper per day did nothing to alleviate cobalt deficiency. The amounts of cobalt present in the livers of animals with extreme cobalt deficiency were similar to values found in normal sheep. Animals receiving cobalt only developed in 28 weeks hypochromic anaemia typical of copper deficiency. These symptoms grew worse during four years. Ewes in this group produced lambs with ataxia. 1 mg. copper per day delayed the onset of symptoms, but the course of the deficiency once present was the same. Animals receiving 5 and 10 mg. copper per day developed no symptoms except that after two years those receiving 5 mg. had deficient keratinization of the wool.

—A. T. PHILLIPSON.

GALL, L. S., SMITH, S. E., BECKER, D. E., STARK, C. N., & LOOSLI, J. K. (1948.) **Rumen bacteria in cobalt deficient sheep.**—*J. Anim. Sci.* 7. 526. [Only abst. given, copied *verbatim*.] 1601

Twenty-one lambs became cobalt deficient after 6 months on a ration low in cobalt after which they were divided into three equal groups. One group served as controls, a second was fed cobalt, while a third received cobalt by injection. Four sheep on pasture were used as normal controls. Several sheep were maintained for a month on restricted food intake comparable to the cobalt deficient animals, but with added cobalt. One week after treatment when the cobalt fed lambs showed signs of recovery, 2/3 [two or three] of the sheep from each group were sampled by stomach tube. The solid material was collected and tested for the kinds and numbers of bacteria in the rumen contents by means of direct slide

counts, Gram stains and anaerobic cultural methods. The remainder of the sheep were tested 2 weeks after treatment was started. Differences in the bacterial flora of cobalt deficient and cobalt fed sheep were detected by these three tests. The slide counts for cobalt fed sheep showed 54.6 billion per gram of fresh material, while the cobalt deficient animals averaged only 30.2 and cobalt injected sheep 30.7 billion. By observing the Gram stain, it was possible to separate all the cobalt fed sheep from the control lambs, while 5 out of 7 of the cobalt injected animals resembled the controls. Culturally the cobalt fed lambs showed more fast growing organisms and higher total growth than the cobalt deficient animals. Culturally the cobalt injected animals fell between these groups. Results from the sheep on restricted diet are incomplete at present.

FLIPSE, R. J., HUFFMAN, C. F., DUNCAN, C. W., & THORP, F., JR. (1948.) **Potassium vs. biotin in the treatment of experimentally induced paralysis in calves.**—*J. Anim. Sci.* 7. 525. [Abst. from authors' abst.] 1602

Calves were fed synthetic milk rations varying only in the carbohydrate source and in the potassium content of the mineral supplement. Five of the calves which received "cerelose" as the carbohydrate and no potassium supplement developed paralysis within 5–63 days. Calves on similar diet plus starch, dextrin, or a potassium supplement did not develop paralysis. Cures were effected by the oral administration of a potassium salt or the subcutaneous injection of biotin.

PEIRCE, A. W. (1947.) **Changes in the concentrations of carotene and of vitamin A in the blood and liver of lambs with increase in age and in the colostrum of ewes.**—*Aust. J. exp. Biol. med. Sci.* 25. 111–117. 1603

The concentration of vitamin A in the blood of new-born lambs from ewes grazing on natural pastures lay between 3–14 $\mu\text{g.}$ per 100 ml. plasma, mean 8 $\mu\text{g.}$ This occurred despite the fact that their dams had previously been subjected to conditions which led to adequate reserves in the liver and to normal concentration in the blood of mature sheep. Maximum values of 60–70 $\mu\text{g.}$, mean 48 $\mu\text{g.}$, per 100 ml. plasma, were obtained following the ingestion of colostrum.

New-born lambs appear to be unable to deal with the comparatively large quantity of vitamin A which they receive from the colostrum, and in consequence the concentration in the blood rises to a high level, never observed in adult sheep. Within a few days, however, metabolism of vitamin A apparently becomes normal. By the

second day after birth, values had fallen to within the normal range for sheep, 25–35 $\mu\text{g.}$ per 100 ml. plasma. Traces of carotene were found in the blood at birth. The values attained between the ages of 1–3 months were only 8–14 $\mu\text{g.}$ per 100 ml. plasma.

The concentration of vitamin A in the liver of a new-born lamb was found to be 11 $\mu\text{g.}$ per g. liver or 870 $\mu\text{g.}$ in the entire liver. Corresponding values at four months were 230 $\mu\text{g.}$ and 109,000 $\mu\text{g.}$ Carotene at birth was at the level of 0.7 $\mu\text{g.}$ per g. liver; from the age of one month, it varied between 1.5–3 $\mu\text{g.}$ per g.

Colostrum contained approximately 800 $\mu\text{g.}$ of vitamin A per 100 g. At the end of the first week after parturition, a constant level of 100 $\mu\text{g.}$ per 100 g. was reached. The milk supplying the lower concentration of vitamin A was supplemented from about two weeks of age by the increasing amounts of carotene ingested in grass. 8–10 $\mu\text{g.}$ carotene per 100 g. were found to be present in colostrum and milk.—C. S. SAPSFORD.

DAVIS, J. E. (1947.) Evidence that the hemolytic anemia caused by fat and choline is not due to lipotropic action.—*Science*. 105. 43–44. 1604

D. demonstrated that the administration of choline chloride, together with a high fat diet, to dogs rapidly caused an acute haemolytic anaemia. In partial explanation, it was postulated that the choline exerts a "holding" action upon the bone

See also abst. 1710 (agonal acidosis).

marrow to prevent an increase in the rate of erythropoiesis and the fat provides products causing the destruction of erythrocytes. These experiments did not preclude the possibility that choline might exert a lipotropic action with the fat and produce anaemia in some manner as a result.

In this study D. tests this possibility by the administration of atropine, which blocks the vasodilatory effects of choline, but does not antagonize its lipotropic action. It was demonstrated that atropine antagonizes the haemolytic anaemia induced by fat and choline. D. believes, therefore, that choline acts by causing vasodilation and improved blood and oxygen supply to the bone marrow, thus tending to depress erythropoiesis. He concludes that choline aids in the production of the anaemia not by virtue of a lipotropic action but rather by its vasodilator, or pharmacological, action.—MALCOLM WOODBINE.

CLARKSON, M. F., & BEST, C. H. (1947.) Absence of a macrocytic anemia in dogs fed choline or choline plus fat.—*Science*. 105. 622–623. 1605

The addition of choline (up to 30 mg. per kg. per day) or choline plus fat (lard) to the stock diets of eight dogs did not produce any trace of macrocytic anaemia in any animal, a finding at variance with that previously described by DAVIS [see preceding abst.].—J. M. ROBSON.

DISEASES, GENERAL

— (1948.) British Agricultural Mission to South America. Summary of a Report submitted to the Minister of Agriculture & Fisheries and the Secretary of State for Scotland.—*Agric. Overseas Rep.* No. 8. pp. 51. London: H.M. Stat. Off. 1s. 1606

The Mission visited South American countries to foster relationships with Great Britain and to promote the sale of British livestock, especially dairy stock.

Items of veterinary interest in the report are the need for representation being made to the Governments of Colombia and Venezuela to amend their restrictions against direct entry of cattle from Great Britain as a precaution against introduction of foot and mouth disease, and to the Governments of Argentina, Uruguay and Brazil regarding their regulations dealing with agglutination tests for brucellosis in vaccinated cattle. White pigs on account of their liability to sunburn are not favoured in S. America. In Colombia a new breed of cattle, the Romosinuano, has been developed which is said to be immune to tick-borne infections. In Chile vaccination against

foot and mouth disease with a locally prepared vaccine of the Waldmann type is done every eight months; since 1942, over two million cattle have been vaccinated.—M. C.

SUTHERLAND, G. N. (1949.) "Blue nose" disease in the horse.—*Vet. Rec.* 61. 89. 1607

S. records two cases of "Blue nose" disease in horses.

His description agrees with that recorded by KERR, MCGIRR & LAMONT [*V. B.* 17. 85.]. The condition is characterized by a degree of mania and by oedema of the nostril region.—D. LUKE.

RODIONOV, I. M. (1941.) [On differentiation of respiratory diseases in horses.].—*Diseases of horses. Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk., Moscow*, 1939. pp. 130–131. 1608

The author deals with three respiratory diseases of horses (a) infectious catarrh, (b) influenza and (c) contagious pleuro-pneumonia. Aetiologically, epidemiologically and clinically these three diseases are different.

Correct diagnosis is of great importance,

because contagious pleuro-pneumonia can be successfully treated with neosalvarsan, which is without effect in the treatment of influenza or infectious catarrh.

Kiselev's suggestion that all three diseases should be included under one name "influenza of horses" cannot be accepted, experiments having proved that all three are immunologically distinct.—K. A. ALLEN.

KÖCHLI, O. (1947.) Pathologisch-anatomische und bakteriologische Untersuchungen über das Wesen der Strahlfäule des Pferdes. [Pathology and bacteriology of thrush in horses.]—*Schweiz. Arch. Tierheilk.* 89. 384-397. 1609

In a bacterial investigation of thrush of the foot in horses, the author found that the bacterial flora present was capable in various degrees of breaking down horn, the process ultimately causing degeneration of the stratum spinosum and stratum germinativum of the hoof horn. The lesion is described as a proliferative pododermatitis.

An account is given of the various micro-organisms isolated in culture.—M. LATZKE.

DONALD, D. E., & ELLIOTT, F. J. (1948.) Auricular fibrillation in horses.—*Vet. Rec.* 60. 473-477. 1610

Auricular fibrillation appears to be relatively common in horses, for out of 130 which were selected at random and examined there was cardiac arrhythmia in 17, in five of which there was auricular fibrillation. Case histories are given.

In such cases the pulse is generally of good quality but extremely irregular in rhythm. Long pauses are followed by isolated beats at irregular intervals, or by short paroxysms of five or six beats in rapid succession. Jugular pulsation is irregularly present, consisting of a marked venous swelling occurring irregularly and collapsing suddenly. The first and second heart sounds follow each other normally, but there is no other evidence of an auricular sound, which in a normal horse is quite distinct. Electrocardiograms for two cases are given.

The cause is obscure. One case was related to overwork, one to an attack of influenza, and two were spontaneous in origin.

If condition is maintained and oedema and marked jugular pulsation are absent in affected draught horses, they can do light work. In the case of riding horses, and of cases where condition is being lost and oedema is present, the prognosis is hopeless; on being exerted circulatory failure might ensue and result in collapse. In none of the cases observed did the fibrillation cease spontaneously.—J. O. L. KING.

SMITH, P. E. (1948.) Pack-mules in Burma.—*Vet. Student, Iowa.* 10. 83-86. 1611

A graphic but hardly scientific account of a mule convoy from Ledo to Myitkyina, 900 miles. Of the 900 mules only 50 were lost, most of them from enemy action or accident in the mountains. Anthrax caused little loss, as the whole convoy had been vaccinated. Epizootic lymphangitis and glanders did not affect the convoy, though the Chinese-owned ponies were badly affected. Surra occurred, and was treated with antrypol and calcium lactate; but it does not seem to have been serious. Maggots were a constant worry. Filariasis is mentioned.—R. MACGREGOR.

SIMPSON, C. F. (1949.) Hyperkeratosis or X disease in Florida.—*Vet. Med.* 44. 51-52. 1612

Cases occurred in four Brahman [zebu] calves four weeks after purchase. There was proliferation of the skin on the legs, neck and other parts of the body, wart-like growths in the mouth, ocular and nasal discharge and salivation. The P.M. findings in one of the calves which was destroyed are described. These are apparently the only cases which have been recorded in Florida.—M. C.

PÁLSSON, H. (1948.) [Investigations on the resistance of Iceland sheep to "Jaagsiekte".]—*Reykjavík [Iceland] Dept. of Agric. Sect. A. Pamphlet No. 1.* pp. 27. 1613

Introduced into Iceland in 1933 by Karakul sheep imported from Germany, jaagziekte has caused heavy losses and has become widespread throughout the country. In individual flocks the mortality varied very considerably and it was believed possible that some strains might be resistant to the disease. When the disease is introduced into a clean flock losses are heavy in the first two years and thereafter decrease. Investigations begun in 1941 by Gislason and still being carried on are considered to indicate that it may be possible by an appropriate breeding policy to produce resistant strains.

Classification of flocks into resistant and susceptible is in hand and breeders are being advised regarding selection or purchase of rams from resistant strains.—P. S. ARDAL.

FRANKHAUSER, R. (1948.) Zur Nachhandlähmung beim Hunde. [Paralysis of the hind quarters in dogs.]—*Schweiz. Arch. Tierheilk.* 90. 494-502. 1614

The author discusses paralysis of the hind-quarters considered to be associated with displacement of an intervertebral disc and consequent pressure on the spinal cord. The condition is common in certain of the long-bodied breeds, such as dachshunds. Sometimes inflammatory changes in the dura mater leading to ossification may also cause such symptoms.—E. G.

McMILLAN, G. C., & DUFF, G. L. (1948.) **Mitotic activity in the aortic lesions of experimental cholesterol atherosclerosis of rabbits.**—*Arch. Path.* 46. 179–182. [Authors' summary copied *verbatim*.] 1615

The observed frequent occurrence of mitotic figures in the foam cells and fibroblasts of the aortic intimal lesions of experimental cholesterol atherosclerosis of the rabbit is interpreted as evidence that a considerable proportion, if not all, of these cells arise *in situ* by mitotic division.

GREENWOOD, M. (1946.) **The statistical study of infectious diseases.**—*J. Roy. Statistical Soc.* 109. 85–103. Discussion 103–110. [Abst. in *Bull. Hyg., Lond.* 22. 612, copied *verbatim*. Signed: W. J. MARTIN.] 1616

Whether a disease is infectious or not has led, in the past, to many disputes. Up to quite recent times some diseases were wrongly classified, *e.g.* influenza and tuberculosis were held to be non-infectious, while bubonic plague was thought to be infectious. It is still not a simple matter to decide whether some diseases are infectious or contagious. The object of Professor Greenwood's paper was to discuss what help the statistician could give in answering this problem. In rural communities, it is sometimes possible to trace the infection and establish the incubation period, *e.g.* the now classical epidemic of catarrhal jaundice described by Dr. PICKLES (*Epidemiology in Country Practice*. 1939. Bristol: John Wright) who determined the incubation period and the

See also absts. 1653 (in Australia); 1672 (altitude disease); 1692 (in Scandinavia); 1701 (diseases of the kidney); 1704 (diseases of young animals); 1705 (diseases of foals); 1710 (agonal acidosis).

POISONS AND POISONING

BLAKEMORE, F., BOSWORTH, T. J., & GREEN, H. H. (1948.) **Industrial fluorosis of farm animals in England, attributable to the manufacture of bricks, the calcining of ironstone, and to enamelling processes.**—*J. comp. Path.* 58. 267–301. 1617

Outbreaks of industrial fluorosis in livestock have been encountered on a number of occasions in England since 1938 and the investigations which have been made are here presented.

One extensive outbreak occurred in a belt about ten miles long and one mile wide down wind from a large number of brick-firing kilns. Contamination of herbage varied from 8 p.p.m. to 90 p.p.m. of the dry matter and the fluorine was distributed very irregularly over the affected farms; this was apparently mainly due to arbitrary surface swirl of the wind-borne smoke determined by soil configuration and length of herbage. In general marked cases of fluorosis only occurred where pasture values exceeded 25 p.p.m. on a dry matter basis. The clay used for brick making

infectious nature of the disease. With other diseases, such as poliomyelitis, the most diligent enquiries have often failed to establish any human connexion or common consumption of food which will link the widely separated foci together. The problem of tracing infection in large towns becomes much more complex because it is not possible to simplify human relations and in large epidemics persons in the same household may be infected from different sources. The author discusses the application of the binomial, poisson, chain binomials and various curves to the graduation of epidemics and the agreement between observed and theoretical values. The difficulties of obtaining a mathematical expression to describe the course of an epidemic are many, and complex biological theories often lead to equations that are intractable and, if they are eventually solved, the theoretical values are not easily tested against the available data. The author illustrated from his mouse experiments the possibility that changes in the infectivity of the organism may cause considerable modification in the character of an epidemic. Two appendices to the paper deal with the problem of intervals and Brownlee's epidemic frequencies.

The author concludes that more data concerning epidemics are needed; that mathematical statistics alone without an understanding of the biological conditions will not do much towards solving the problem; and that more experimental epidemiology is necessary.

in this area is of a special type containing from 450–550 p.p.m. of fluorine and about 10% of organic matter, and fluorosis does not occur in association with brick kilns burning other types of clay. In survey work valuable information is obtained by urinary analysis and a modified technique which enabled one operator to analyse 12 samples a day is described in an appendix. Normal urinary values were from 2–6 p.p.m.; in clinical cases they varied from 16–68 p.p.m. and in cattle on the edge of the affected area values of the order of 11 p.p.m. were found. Normal values for fluorine in urine and in bone are discussed and very high values may be present without clinical signs being observed. The rate of excretion in affected cattle was studied. That high fluorine values of herbage are caused solely by surface contamination and not by absorption from the soil was proved by experiments involving the growing of plants in the affected area on soil brought from unaffected areas and *vice versa*. The presence of fluorine in the chimney gases was confirmed by a

sampling technique which is described. In the process of burning about one-third of the total fluorine in the clay is lost. The clinical signs and P.M. findings in 11 cattle are described in detail. Sheep in the area had dental changes but were in good health and had no skeletal abnormalities. On none of the farms was there any history of horses being affected. The possible explanation is that the horses were largely fed on purchased foodstuffs and very few horses are bred within the area. The histological findings in affected bone are described.

In another outbreak the source of contamination was the calcining of ironstone to reduce its weight before transport to the smelting works. Here the contaminated area was much smaller. In yet another outbreak the fluorine was derived from a colour and enamelling factory; clinical signs in the affected cattle were not so severe as in the other outbreaks. Human beings on the affected farms in these outbreaks did not appear to suffer any damage, which is explained by the fact that in man the dietary risk is confined to the exposed outer leaves of vegetables which are either discarded or washed before consumption. The economic aspect of fluorosis from factory smoke is discussed and suggestions made regarding methods of agriculture which might be adopted to minimize losses. Case histories and P.M. findings are detailed in an appendix.—M. C.

COLE, V. G. (1948.) Illness in sheep following dipping in "gammexane" dip.—*Aust. vet. J.* 24. 295-297. 1618

A description of an outbreak of illness and lameness which followed dipping in gammexane, and of the experiments which indicated that the condition was *Erysipelothrix rhusiopathiae* infection resulting from contamination of the dip.

—N. WICKHAM.

MCMAMARA, B., & KROP, S. (1948.) The treatment of acute poisoning produced by gamma hexachlorocyclohexane.—*J. Pharmacol.* 92. 147-152. 1619

In experiments on dogs and rabbits the δ -isomer of hexachlorocyclohexane had some value in the treatment of acute poisoning caused by the γ -isomer [gammexane]; phenobarbital and pentobarbital had both prophylactic and therapeutic values to a marked extent.

The symptoms of poisoning were restlessness, increases in depth and frequency of respirations, blepharospasm, muscular tremors, convulsions, cardiac and respiratory failure.—M. R. ORMEROD.

CLARE, N. T., WHITTEN, L. K., & FILMER, D. B. (1947.) A photosensitized keratitis in young cattle following the use of phenothiazine as an anthelmintic. III. Identification of the photo-

sensitizing agent.—*Aust. vet. J.* 23. 844-848. 1620

The keratitis described above was produced experimentally by injecting phenothiazine sulphoxide into the anterior chamber of the eye of calves exposed to sunlight. Control experiments were made by injecting 0.2 ml. of saline alone into the eye of another calf and exposing it at the same time, and also by injecting sulphoxide solution and keeping the animal in the dark. The eyes in these control animals were not affected. The sulphoxide is a metabolic product of phenothiazine and is found in the blood and aqueous humour of calves dosed with the anthelmintic.

The radiation which produced keratitis following the injection of the sulphoxide lies in the same range of wavelengths (up to 360 m μ) as that which causes keratitis in calves dosed with phenothiazine. This portion of the spectrum containing the active wavelengths corresponds with the absorption spectrum of the sulphoxide. The authors concluded that phenothiazine sulphoxide is the photodynamic agent responsible for the photosensitized keratitis in calves treated with phenothiazine as an anthelmintic. A similar keratitis has been seen, and experimentally produced, in sheep, but this appears to be related to individual idiosyncrasy or to the use of a very large dose [see p. 352, abstr. 1584.].—H. MCL. GORDON.

NATALE, L. (1946.) Su alcuni casi di avvelenamento da "Mercurialis annua" dei bovini. [Poisoning of cattle by *Mercurialis annua*.]—*Zooprofilassi*. 1. No. 5. pp. 15-18. 1621

The toxic properties of *Mercurialis annua* and signs of poisoning in cattle from the ingestion of this plant are described. Of seven cattle affected, two were killed *in extremis* and the remainder recovered under treatment with sodium bicarbonate and intestinal emollients. On P.M. examination of the former there were numerous haemorrhagic infarcts in the kidneys, and cloudy swelling of the liver. The meat of such animals is considered safe for human consumption if the animal is well bled, but the offal is all condemned.

—R. MACGREGOR.

ANDERSON, L. H., & WELLS, J. A. (1948.) Attempts to prevent ergot gangrene with heparin and dicumarol. Vascular effects of ergot by fluorescein technic.—*Proc. Soc. exp. Biol., N.Y.* 67. 53-56. 1622

In experiments on rats the authors observed that the anticoagulant action of heparin and dicumarol was ineffective in preventing the development of necrosis of the tail in rats subsequently treated with ergotamine. They concluded that thrombosis was incidental and not contributory to such necrosis, and that the ergot

alkaloids were alone responsible for the severe vascular impairment. Experiments with fluotescsein indicated that ergotamine impairs the circulation to the tail preferentially.—M. R. O.

MARQVARD, H. (1948.) Saenkingsreaktionen ved hugormebid. [Stabilizing action of the venom of *Vipera berus berus* on a blood suspension after bites from the viper.]—*Nordisk Med.* 37. 588–589. [Abst. in *Trop. Dis. Bull.* 45. 539–540. (1948), slightly amended. Signed: H. G. O'D. BURKE-GAFFNEY.] 1623

Bergenheim and Fåhrens (1936) and Bergenheim (1938) have demonstrated the stabilizing power of lysolecithin in pre-haemolytic concentrations on a blood suspension *in vitro*. Because of

its lecithinase content, cobra venom has the same stabilizing action. In 10 hospital patients, who had been bitten by *Vipera berus berus* 12 to 24 hours before, it was found that the lysolecithin formed by the lecithinase in the blood suspensions stabilized them. It is believed that venom is the stabilizing substance. Antivenom serum given later than an hour after the inoculation of venom does not check the stabilizing action, lysolecithin already formed is not adversely affected by the antivenom serum, but serum given half-an-hour after the inoculation of venom evidently restricts the action of the lecithinase, because in this case the formation of lysolecithin and its stabilizing action are clearly reduced.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

NEITZ, W. O. (1947.) Certain aspects of chemotherapy.—*J. S. Afr. vet. med. Ass.* 18. 148–155. 1624

N. reviewed some aspects of chemotherapy in relation to South African Veterinary Medicine, including considerations of infection with leishmania, trypanosomes, plasmodia, rickettsia and schistosoma. He discussed the incidence of drug resistance and, more particularly, the "significance of the provacatory influence of chemotherapeutics" and suggested that, under the provacation of certain drugs, the reticulo-endothelial system permits the development of histotropic parasites which are known to be drug sensitive at the haemotropic stage and referred to the extensive work with plasmodia in this connexion.—M. W.

GENEST, P., & BERNARD, R. (1945.) Etude de l'action des sulfamidés sur la formation de la coquille de l'oeuf chez la poule. [Action of the sulfonamides on shell formation in hens' eggs.]—*Rev. Canad. Biol.* 4. 172–192. 1625

Pullets given unsubstituted sulphonamides—sulphanilamide and sulphapyridine in the food laid thin rough-shelled eggs. Substituted sulphonamides, including sulphathiazole, sulphaguandine, sulphamerazine and sulphadiazene had a negligible effect on egg shell thickness and the shells were smooth.—P. J. G. PLUMMER.

WATTS, P. S., & McLEOD, D. H. (1948.) The concentration of penicillin in the milk after intramammary infusion.—*J. comp. Path.* 58. 232–243. 1626

The concentration of penicillin in the milk of 130 cows after each of their quarters was injected with 20,000 units in 50 ml. distilled water was studied. The authors' results did not support those of other workers who claim that in cows in which intramammary infusions of penicillin are given an inverse relationship exists between the

unitage of penicillin recovered from the milk and the yield of milk. There was considerable variation in the amount of penicillin recovered and this could not be attributed to the volume of milk, age of cow, stage of lactation or chloride content. The concentration of penicillin in any quarter was significantly lowered if the animal had mastitis. Introducing the penicillin in a small volume of diluent instead of 50 ml. gave a greater percentage of penicillin recovery.

The variations obtained were great and could not be attributed to the batch of penicillin or the temperature of injection. It is suggested that allergic responses may result from continued injections.—MARCUS S. BROOKE.

SMITH, C. R., PETERSEN, W. E., & BROWN, R. W. (1948.) Effect of infused streptomycin in the mammary gland.—*Proc. Soc. exp. Biol., N.Y.* 68. 216–219. 1627

100,000–500,000 units of streptomycin of a concentration of 20,000 units per ml. were injected per quarter in five cows and 140,000 or 200,000 units were infused into one-half of the udder in a goat. Data concerning the relation between the concentration per ml. found in milk samples and size of dose, interval between infusing and sampling, and milk production of individual quarters were obtained. The elimination of streptomycin in the urine was studied and significant amounts were found in urine samples 27 hours after infusion. Examinations of blood for the presence of streptomycin gave negative results. Under the experimental conditions streptomycin appeared to be relatively non-toxic and non-irritant.—M. R. ORMEROD.

DAVIS, H. (1948.) Para-aminosalicylic acid.—*Mon. Bull. Min. Hlth publ. Hlth Lab. Serv.* 7. 109–112. 1628

Following criticisms in regard to purity and

potency of commercial samples of the sodium salt of *p*-aminosalicylic acid because they give coloured solutions whereas solutions of the pure sodium salt are colourless, analyses were undertaken.

Significant loss of potency occurs if solutions of the sodium salt are autoclaved, due to irreversible decarboxylation. Solutions for injections parentally should be sterilized by filtration.

Methods of assay are discussed. Three commercial samples of *p*-aminosalicylic acid, which were white or cream in colour, were found, by the methods of alkali titration and bromination, to contain 92.4–99.6% acid. Results indicate that commercial samples of *p*-aminosalicylic acid and solutions of sodium *p*-aminosalicylate which may be dark reddish brown in colour are suitable for clinical purposes.

The chemical and tuberculostatic properties of *p*-aminosalicylic acid are described briefly.

—NESTA DEAN.

See also *absts.* 1420 (mastitis); 1421 (anthrax); 1427–1431 (tuberculosis); 1442 (fowl cholera); 1478 and 1479 (foot rot); 1481 (actinomycosis); 1502 (trichomoniasis); 1507 (blackhead); 1508–1510 (coccidiosis); 1577 (fascioliasis); 1583 and 1584 (phenothiazine); 1586 and 1587 (sodium fluoride); 1589 (colchicine); 1602 (paralysis).

CARLINFANTI, E., D'ALÒ, F., & CUTOLO, L. (1949.) Long-acting preparation of testosterone.—*Lancet*. 256. 479–480. [Authors' summary copied *verbatim*.] 1629

A preparation of testosterone with depot action is described. It is stable and can be administered with a fine needle. It has the advantage of reducing the frequency of injections to one a month or less and obviates the need for surgical implantation of pellets.

TURNER, N. (1947.) A test for synergism between DDT and nicotine-bentonite in dusts.—*J. econ. Ent.* 40. 553–556. 1630

In tests of the effectiveness of 3:1, 2:2 and 1:3 mixtures of D.D.T. and nicotine-bentonite dust it was found that 3:1 and 2:2 D.D.T.-nicotine produced antagonism, but no mixture gave statistically significant synergism.—B. A. T.

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

OPIE, E. L. (1949.) The movement of water in tissues removed from the body and its relation to movement of water during life.—*J. exp. Med.* 89. 185–208. [Author's conclusions copied *verbatim*.] 1631

During the initial period following immersion of parenchymatous cells of liver, kidney, or pancreas in various fluids immediately after their removal from the body water exchange is like that which occurs when water passes by osmosis through a semipermeable membrane; intake of water is proportional to the square root of the elapsed time and when liver tissue is immersed in solutions of sodium chloride movement of water is approximately proportional to the concentration of the solution.

Solutions of sodium chloride isotonic for parenchymatous cells of liver have twice the molar concentration of sodium chloride in the blood serum; for those of the kidney slightly less than twice and for those of the pancreas three times this concentration. When interstitial tissue of thymus, omentum, or pancreas is immersed in water, it undergoes edema-like swelling caused by hydration of the colloids of the fibrous tissue; quantitative water exchange in an initial period accords with water movement by osmosis and is proportional to the square root of the elapsed time.

Solutions of sodium chloride isotonic for fibrous tissue of the omentum have slightly greater molar concentration than the sodium chloride in the blood serum and for that of the thymus approxi-

mately the same as that of blood serum. Sodium chloride produces changes in fibrous tissue which increase with increasing concentration its power to hold water; the dense fibrous tissue of the corium of the skin and of the wall of the aorta takes up water in both weak and strong solutions of sodium chloride. The initial movement of water induced in tissues in the period immediately following removal from the body is dependent upon forces which are active during life but soon impaired by injury to the tissues. The molar concentration of the contents of secreting cells is greater than that of the blood serum and of the fluid surrounding them. These conditions are favorable to the passage of water from the tissue spaces to the cells.

AUSTIN, C. R. (1948.) Function of hyaluronidase in fertilization. [Correspondence.].—*Nature, Lond.* 162. 63–64. 1632

In the rat, the mass of follicle cells of the cumulus remain intact around the ovum for a considerable time after fertilization, and the presence of male and female pronuclei can be seen under the phase contrast microscope. Frequently the cumuli are indistinguishable from those obtained from unmated rats. A similar state of affairs seems to exist in the cat.

It is concluded that penetration of the intact cumulus by the sperm does occur and that denudation, at least in some species, is not a prerequisite of fertilization. The destruction of the

cumulus prior to sperm entry is not, therefore, an essential function of hyaluronidase, though it may assist the passage of the individual sperm.

—A. W. MARRABLE.

TOMPKINS, E. H. (1948.) Methods to increase accuracy in the use of Hayem's solution for red blood counts.—*J. Lab. clin. Med.* 33. 1180–1188. [Author's conclusions copied *verbatim*.] 1633

Hayem's solution carries an inherent capacity for the balling or clumping of cells when used for red blood counts. The tendency toward clumping is magnified by gentle rotation but underlies all manners of mixing. It affects the dependability and accuracy of counts made with Hayem's solution.

The capacity for clumping inherent in Hayem's solution is due to the component of bichloride. It can be eliminated by decrease of the proportion of bichloride to that of Jörgensen's solution, together with control of the pH of the diluent between 5.0 and 7.0, or by addition of gelatin to Hayem's solution without concern for pH below 7.0.

Counts made with these modifications of Hayem's solution are subject to less deviation than are counts made with Hayem's solution alone under the same conditions.

Use of Hayem's solution containing gelatin allows greater flexibility of experimental conditions without loss of protective power than does use of Jörgensen's solution. Addition of gelatin to Hayem's solution is, therefore, the modification preferred.

NOSSAL, P. M. (1948.) The metabolism of erythrocytes. I. Respiration in the absence and presence of methylene blue.—*Aust. J. exp. Biol. med. Sci.* 26. 123–138. 1634

N. describes the respiration of rabbit erythrocytes in the presence of hexoses, pentoses, disaccharides, tricarboxylic acids, dicarboxylic acids and some miscellaneous compounds.

It was found that the respiration of mature erythrocytes was very small, and not influenced appreciably by hexoses, pentoses or disaccharides. There was, however, notable increase in oxygen uptake after the addition of dicarboxylic acid and citric acid. The presence of methylene blue increased the activity of the hexoses, and to a less extent of the pentoses and disaccharides.—N. W.

SHAW, F. H., KEOGH, P., & MACCALLUM, M. (1948.) The possibility of the dual nature of sympathetic ganglion cells.—*Aust. J. exp. Biol. med. Sci.* 26. 139–146. 1635

It is known that adrenergic postganglionic

sympathetic fibres may either cause vasoconstriction or vasodilatation depending on the site of action. The authors have analysed these phenomena using nicotine, yohimbine, atropine, acetylcholine, lobeline, tetramethylammonium chloride and quinine methiodide as pharmacological "tools". Dogs and cats were used as experimental animals.

From their results the authors have postulated two types of adrenergic postganglionic fibres having the following pharmacological characteristics:—C fibres—these are stimulated by acetylcholine, and at first stimulated and later paralysed by nicotine. Yohimbine interferes with the adrenalin-like action of these fibres, which normally produce vasoconstriction. D fibres—these are stimulated by acetylcholine and are only paralysed by nicotine in much larger doses than the C fibres. Yohimbine does not interfere with the adrenalin-like action of these fibres, which normally cause vasodilatation.

The complex experimental details of this study are given.—J. D. BIGGERS.

I. GRÉGOIRE, C. (1946.) Influence de la prolactine sur la régénération post-gravidique du thymus de l'animal sevré. [Influence of prolactin on the regeneration of the thymus after weaning.]—*C.R. Soc. Biol., Paris.* 140. 1216–1218. 1636

II. GRÉGOIRE, C. (1947.) Failure of lactogenic hormone to maintain pregnancy involution of the thymus.—*J. Endocrinol.* 5. 115–120. [In English.] 1637

I & II. Thirty-seven rats, aged 6–7 months, were ovariectomized at parturition and their litters removed. Twenty of them were injected daily for ten days with 36 Riddle units of prolactin; 17 were used as controls, being given daily injections of the prolactin solvent. All rats were killed on the 11th day and the thymus, thyroid glands, adrenal glands, spleen and various lymph nodes, were weighed. These organs and also portions of the mammary glands were examined histologically. In the control group the mammary glands had involuted, whereas in the prolactin-treated group mammary regression had more or less been prevented. The thymus weights in both groups were similar and it was therefore concluded that prolactin is not the factor responsible for maintaining pregnancy involution of the thymus during suckling. Adrenal weights were similar in the two groups, but spleen weights were higher in the prolactin-treated animals. Thyroid weights were less in the treated group and histologically the glands appeared less active in this group.

—ALFRED T. COWIE.

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

BYWATER, H. E. (1948.) **The legal position with regard to meat inspection in England and Wales.**—*Vet. Rec.* 60. 347-348. 1638

A historical survey of the law relating to sale of meat and a summary of present-day law as consolidated in the Food and Drugs Act, 1938. Under this law, only authorized officers (who must be a M.O.H., veterinarian or sanitary inspector) may seize unfit meat, and they may not condemn it. Condemnation may only be done by a Justice of the Peace, and the owner can appear before him and dispute the seizure. Butchers are advised to surrender obviously unsound meat voluntarily; but, if they feel inclined to dispute the matter with an authorized officer they should take steps as soon as possible to have the meat examined by an independent witness so as to prepare the case for the magistrate.—R. MACGREGOR.

BYWATER, H. E. (1948.) **Public and private slaughter-houses in England and Wales.**—*Vet. Rec.* 60. 219-220. 1639

The only advantage to be claimed for the small independent butcher is the claim that his meat has a better "bloom", due to the short distance from his slaughter house to his shop. Against this, the public abattoir has many advantages. It can be built with regard to town planning; it results in economy and improvement in the handling of by-products, inspection, hygiene and humanity; and it reduces illegal slaughtering. It should be run in conjunction with a knackery to dispose of unsound carcasses in a suitable manner and should be under the control of the Ministry of Agriculture rather than the Ministry of Health.

—R. MACGREGOR.

SEHER, O. W. (1948.) **Disposal of carcasses by incineration.**—*J. Amer. vet. med. Ass.* 113. 32-33. 1640

The difficulties of destroying carcasses infected with foot and mouth disease in areas where fuel is unobtainable are described. Army flame throwing fuel made of stearic acid salt dissolved in petrol was too volatile and too dangerous to the users. Magnesium dust paste smeared over the carcass and then ignited was too expensive and failed to consume the carcass entirely. Good results were obtained from oil and discarded motor tyres, the latter burning fiercely and producing an intense and lasting heat as soon as they were ignited by the oil.—R. MACGREGOR.

ASH, C. (1947.) **Some problems of meat transportation.**—*J. R. sanit. Inst.* 67. 266-275. Discussion pp. 275-276. 1641

The discussion on this paper was based mainly on the transport of meat in contractors' vans intended and frequently used for other purposes.

The contractors are unwilling to allot vans solely for this purpose until it is certain that the Government intends the present arrangement of centralized slaughtering to continue. Retailers are also unwilling to invest capital in the purchase of their own vans until they know for certain about the future. Suggestions were made for the licensing of meat vans, such licence to be granted only on condition that the van is clean and in good repair and not used for other purposes; but this would be ineffective without legislation to make it a criminal offence to break the terms of such a licence.—R. MACGREGOR.

AHMED, S. M. (1948.) **Meat inspection in India command.**—*J. R. Army vet. Crps.* 19. 72-75. 1642

The responsibility for the inspection of meat supplied to the Indian Army was assumed by the Army Veterinary Service in 1944. This necessitated the organization of special courses as the Veterinary graduates of the Indian Colleges had insufficient knowledge of the subject. It was also necessary to train butchers in clean dressing, a difficult task as the personnel was frequently changed. However, condemnation of carcasses contaminated in dressing was having a good effect. The major butcher animals dealt with were goats and sheep, and the animals were frequently starved and infested with parasites. Hence half of the total condemnations were on account of extreme emaciation or generalized oedema.

Pigs usually came from military farms and were as a whole in good condition, but *Cysticercus cellulosae* was found in 204 out of 14,000 carcasses.

Cattle also were usually in good condition, but *C. bovis* was found in 20 out of 1,000 carcasses. Only three carcasses, all pigs, were condemned on account of TB. Caseous lymphadenitis caused the condemnation of 565 carcasses of sheep.

Information is given concerning the staff required for the work.—R. MACGREGOR.

BJÖRKMÄN, T. (1948.) **Förpackningssättets, speciellt glycerinförpackningens, inflytande på undersökningsresultatet vid insändande av lymfkörtlar för bakteriologisk köttkontroll. [The influence of packing methods, especially glycerol packing, on the results of the examination of lymph nodes sent in for bacteriological meat inspection.]**—*Skand. VetTidskr.* 38. 1-35. [Abst. from English summary.] 1643

In order to eliminate superficial contamination with micro-organisms which would influence bacteriological tests, the author recommends the packing of lymph nodes sent for examination, particularly during the summer months, in a 50% glycerol solution as a bacteriostatic agent. Care

should be taken to remove the lymph nodes together with a protective layer of perinodal tissue before sending to the laboratory.—E. G.

GINSBERG, A. (1948.) **The differentiation of meats by the precipitation test.**—*Vet. Rec.* 60. 683-685. 1644

Raw meat, unmelted fat, and cured or smoked meat can be examined by the precipitation test for detection of adulteration with meat other than that specified, and results can also be obtained from cooked meats provided the temperature has not risen above 80°C. Much of the text is well known.—R. MACGREGOR.

MEARA, P. J. (1947.) **Meat studies No. 2.—Toughness of meat.**—*Onderstepoort J. vet. Sci.* 21. 467-482. 1645

Tenderness in meat is due to the amount and kind of connective tissue, the development and density of the muscle fibres and size of muscle bundles ("grain"), the amount and distribution of the fat, and the "degree of ripeness" or the period of resolution of rigor. Probably the best method of testing it is by means of testing panels of selected persons, but as this is not usually practicable, various types of measuring apparatus have been devised based on the resistance of uniform samples to shearing or crushing. Tenderness can be improved by hammering, which breaks down muscle fibres; by quick freezing before rigor mortis sets in; by the use of the enzymes papain and bromelin obtained from the papaya and pineapple; and finally by careful cooking.—R. MACGREGOR.

ANTHONY, D. J., & HOWIE, D. (1948.) **The pancreas in sausage meat.**—*Vet. Rec.* 60. 158. 1646

Uncooked pancreas, tonsils, salivary glands and lymph nodes were each placed separately in sausage casings. After cooking for 10 min. at 170°F. the casings containing pancreas burst and shrivelled from 12 in. to 3 in. giving the appearance of having been soaked in strong corrosive. The casings containing lymph nodes were unaffected by cooking for 40 min. at 180°F. and the remaining casings were rendered somewhat thinner, but not otherwise damaged.—R. MACGREGOR.

BROWN, J. H. (1948.) **Alberta: the only rat-free province in Canada.**—*Canad. J. publ. Hlth.* 39. 367-374. 1647

B. outlines the geographical and climatic features of Western Canada and reviews its settlement since 1860.

An account is given of the methods of invasion and causes of migration among rats, their arrival and spread in North America, particularly in Western Canada.—J. F. A. SPRENT.

I. BROCC-ROUSSEU, D. (1946.) *Le laboratoire*

de recherches vétérinaires de l'armée. A.—Sa création. [The army veterinary research laboratory. A. Its foundation.]—*Cah. Méd. vét.* 16. 97-100. 1648

II. CHAILLOT. (1946.) *Le laboratoire de recherches vétérinaires de l'armée. B.—Ses diverses étapes.* [The army veterinary research laboratory. B. Its different stages.]—*Ibid.* 101-104. 1649

I & II. The laboratory was started during the 1914-18 war to study ulcerative lymphangitis and epizootic lymphangitis as they occurred in the French cavalry, but was closed down at the time of the general demobilization. It was re-assembled in July 1919 to study the use of war gas in peace time and was housed in a room in the Pasteur Institute, where the value of chloropicrine as an exterminator of rats, weevils and bugs was proved. In Sept. 1920 a large laboratory was approved, thanks to the personal efforts of M. Clemenceau, and it was finally installed at Fontenoy. Strangles and glanders were the chief diseases studied, with epizootic lymphangitis and tinea next in importance. Feeding and rationing of horses were also investigated. In 1931 the laboratory was transferred to Alfort and combined with the Veterinary School. It continued work till 1939 investigating numerous outbreaks of influenza and infectious anaemia in horses. After the outbreak of war it supplied equine encephalomyelitis vaccine for horses imported from America. In 1942 it was used as a store and distribution centre for food parcels for French prisoners of war and civilians, but started work again in 1944 after liberation. It is now a branch of the Public Health Service and it is hoped will combine research into human and animal medicine and pharmacy.

—R. MACGREGOR.

ANON. (1948.) **Rapport sur le fonctionnement des Services vétérinaires en Allemagne pendant l'année 1946.** [Report on veterinary services in 1946 in the French zone of Germany.]—*Bull. Off. internat. Epiz.* 29. 12-26. 1650

During the year foot and mouth disease appeared in the Rhineland, due to clandestine imports from the British zone, but rigorous police measures prevented its spread. The virus was not particularly virulent. Vaccines supplied by the Foot and Mouth Disease Institute at Basle were effectively used. Twenty-seven cases of glanders were detected among horses supplied for reparations and there were probably more undetected cases in the countryside. Equine mange spread rapidly, owing to troop movements, and military gas chambers were generally used for treatment. Two thousand cases of swine erysipelas were reported and active and passive immunization were used when possible. Thirteen thousand

six hundred cases of sheep scab were reported. Contagious abortion appeared to be rare, 0.04% of samples examined proving positive, but trichomoniasis was spreading rapidly. Two laboratories had been opened, at Fribourg and at Sarrebruck, the latter providing also an artificial insemination unit.—R. MACGREGOR.

ALEGREN, A., & LAURITZSON, I. [Edited by] (1944.) *Samling av författningar, cirkulär m. m. rörande veterinärväsendet i Sverige. [Collection of statutes, circulars, etc., concerning veterinary affairs in Sweden.]* pp. xxx + 1433. Norrtälje: Norrtälje Tidnings Boktryckeri A.-B. 1st Edit. 1651

This massive tome collects all official edicts of all kinds which were issued between 1931 and 1943 for the control of veterinary work, and so incorporates everything that Swedish veterinarians have to know about the Government-regulated parts of their work.

The contents can be broadly classified as follows:—organization of State veterinary affairs, the provincial district services, the veterinary college, veterinary medical institute, veterinary instruction, pensions, official record keeping, notifiable diseases, food inspection, import and

export of livestock and animal products, disinfection, pharmacy, and other matters. For ease in reference there are two indexes arranged for subject and chronology and there are also lists arranged according to animal species.

The issuing authorities include the King in Council, and Government departments, 21 types of edict being issued.—J. E.

ANON. (1948.) *The present and future of military veterinary medicine.*—*Bull. U.S. Army med. Dept.* 8. 94-96. 1652

The conception of a Veterinary Corps concerned only with sick and wounded animals has been dead 20 years. The modern Army Veterinary Corps inspects food for the troops, and helps to re-establish herds in war-scarred areas. Under stress of war, horse and mule transport can assume considerable importance. Pigeons and dogs are also valuable aids to the army, and in foreign countries provide problems in disease not usually encountered at home. The modern Army Veterinary Corps must also be prepared to study the effects of atomic radiation on food stocks and on herds of food-producing animals.

—R. MACGREGOR.

LIVESTOCK HYGIENE

SEDDON, H. R. (1947.) *Influence of movement of animals on the spread of disease in Australia.*—*Aust. vet. j.* 23. 200-209. [Discussion pp. 209-212.] 1653

S. outlines the movements of animals in Australia and then discusses a number of diseases in detail, with special reference to their dissemination in consequence of such movements. There are few animal diseases indigenous to Australia—they include two forms of leptospirosis (due to *L. pomona* and *L. mitis*), Q fever (a rickettsial infection), psittacosis, and certain parasites, e.g. *Ixodes holocyclus* and tick paralysis. A number of diseases had been introduced and failed to become established, e.g. F. & M. disease (1871-1872), rabies (1867) and glanders (1891). Certain diseases were introduced, became established, but have been eradicated, e.g. rinderpest in Western Australia, swine fever (Western Australia and twice in New South Wales), Newcastle disease, Surra and sheep scab. The spread of bovine contagious pleuro-pneumonia, cattle tick and tick fever, are discussed in some detail. There are comments on many parasites and their present and possible geographical distribution in Australia.

Liver flukes have recently been reported in areas of South Australia not known previously to be affected, where this infestation and black dis-

ease have recently been responsible for heavy losses. A suitable native snail host exists in these areas; on the other hand, in other areas in which the snails occur there is no record of liver flukes. It is stated that there is also in Western Australia a native snail that could act as a host, but liver flukes are absent.

In opening the discussion on this paper Rose cited many instances of the spread of disease through movement of stock and included instances in which it was not commonly considered that movement played much part in the spread of the diseases concerned. Gregory drew attention to the possibility that diseases of stock might appear in Australia with atypical clinical manifestations, and instanced the characteristics of Newcastle disease of fowls as it appeared in the U.S.A.

—H. McL. GORDON.

SEDDON, H. R. (1947.) *Host snail for liver fluke in West Australia. A correction.* [Correspondence.]—*Aust. vet. j.* 23. 302. 1654

In correspondence a correction is made to a statement made by Seddon [see preceding abst.]. S. points out that the snail found in Western Australia is *Lymnaea lessona* which has been shown not to be an intermediate host for *Fasciola hepatica*.

—H. McL. GORDON.

GLOVER, R. E. (1948.) *The influence of the small*

animal breeder on biological research. [Abridged.]—*Proc. R. Soc. Med.* 41. 85-92. 1655

After a brief mention of types of housing, cages and bedding and of the diseases of laboratory animals, G. discusses the diet and the influence of diet on susceptibility or resistance to various infections. The value of standardized pure-lines in research work and the importance of latent infections are discussed. Plans for the improvement of supplies of small animals for laboratory use have been made and an advisory committee and a Central Bureau have been set up by the Medical Research Council. The Bureau will keep a register of breeders and will establish contacts between suppliers and users.—M. C.

DUGUID, J. P., & WALLACE, A. T. (1948.) Air infection with dust liberated from clothing.—*Lancet*. 255. 845-849. [Authors' summary copied *verbatim*.] 1656

The number of bacteria-carrying dust particles liberated from a person's skin and clothing into the air of a small chamber as a result of various bodily activities has been measured by examining the air with a slit sampler.

Large numbers of bacteria-carrying dust particles were liberated by even slight activity—e.g., about 1000 per min. by a person making movements equivalent to changing culture plates in a slit sampler. Very large numbers were liberated by more vigorous activities—e.g., about 10,000 per min. by a person "marching". Some 10% of these bacteria-carrying dust particles remained air-borne for half an hour.

Experiments with nasal carriers of *Staph. aureus* showed that the air was infected with this pathogenic organism more regularly and to a greater degree by the liberation of dust from clothing than by sneezing. *Staph. aureus* was present in about 0.1% of the bacteria-carrying dust particles which entered the air from the clothing of carriers.

Air contamination with dust-borne bacteria from clothing was reduced only a little—e.g., to about half—when a sterile loose cotton gown of the usual surgical pattern was worn over the ordinary clothing, but it was reduced very greatly—e.g., to a tenth or a twentieth—when a sterile dust-proof gown was worn.

REPRODUCTION AND REPRODUCTIVE DISORDERS

KRIISA, A. (1947.) Besamungsergebnisse mit 24-36 Stunden aufbewahrten Rindersperma. [Insemination results with bull semen stored for 24-36 hours.]—*Dtsch. tierärztl. Wschr.* 54. 296-297. 1657

Tests proved that undiluted bull semen of good quality, stored for 24-36 hours, was just as good as fresh semen.—M. LATZKE.

FOOTE, R. H., & SALISBURY, G. W. (1948.) The effect of sulphonamides upon the livability of spermatozoa and upon the control of bacteria in diluted bull semen.—*J. Dairy Sci.* 31. 769-778. 1658

Since certain sulphonamides inhibit the metabolism of most cells and some increase the viability and fertility of bovine spermatozoa, the effect was studied of 12 selected sulphonamides on bull semen diluted with citrate-phosphate and stored at 20°C. Each experiment included a positive control containing sulphanilamide at the established level of 300 mg. per 100 ml. of diluted semen, and a negative control containing no sulphonamide. The length of life and motility of the spermatozoa on storage were the measures of viability used: bacterial growth was measured chiefly by the plate count method. Twenty-three first ejaculates, 11 second and two third ejaculates were used. Sulphanilamide and several other sulphonamides exerted a pronounced bacteriostatic effect while, as a rule, bacterial growth was inversely proportional to the amount of sulphon-

amide present irrespective of the particular drug used. In high concentration (100% of maximum solubility) each of the more soluble sulphonamides was toxic to spermatozoa. At their optimum level for spermatozoan survival nine of the 12 drugs tested were superior to the negative controls in preserving the life of the spermatozoa, and three of them—sodium sulphadiazine, sodium sulphamethazine and carboxy-sulphathiazole—excelled sulphanilamide in this respect: only the latter two drugs were markedly superior to sulphanilamide in respect of the preservation of viability, but they were inferior in controlling bacterial growth. Sulphanilamide and N¹-benzoylsulphanilamide consistently decreased the rate of movement of the spermatozoa, although the former increased the duration of motility. At 20°C. and at 37.5°C. all of the 12 sulphonamides tested were effective in reducing bacterial growth at levels which were not harmful to the spermatozoa. In the presence of egg-yolk at 5°C. none of the drugs markedly decreased the growth of organisms surviving at that temperature, particularly *Pseudomonas pyocyanea*.—CLIVE BRIGGS.

DALZIEL, C. F., & PHILLIPS, C. L. (1948.) Electric ejaculation. Determination of optimum electric shock to produce ejaculation in chinchillas and guinea pigs.—*Amer. J. vet. Res.* 9. 225-232. 1659

The authors are of the opinion that the optimum electric shock to produce ejaculation in

chinchillas and g. pigs, with electrodes in the anus and on the skin of the lumbar region respectively consists of an intermittent alternating current between 8 and 16 root mean square milliamperes ; on period about three sec., off period between shocks about 12 sec., and frequency between 500 and 1,500 cycles. Details of necessary safety measures are given.—ARTHUR W. MARRABLE.

BURKHARDT, J. (1948.) **Some clinical problems of horse breeding.**—*Vet. Rec.* 60. 243-248. 1660

Thoroughbred horse breeding is of necessity somewhat artificial because the demand for forward two-year-olds necessitates a short breeding season from February 14th to June 14th, and so the two months most favourable for short heat periods and regular ovulations are lost. Brood mares which have bred winners are retained for breeding when 15 years and upwards and do much to reduce the overall fertility percentages. The vulva is placed higher than in ponies, and the danger of aspirating air and dust, with consequent infection of the uterus, is greatly increased. The vulva may be relaxed during oestrus, so that bacteria can enter and set up a temporary infection. Suturing will prevent further aspiration, but nine weeks' rest may be necessary before service. There are also certain mares, the descendants of which are genetically "shy" breeders.

Barren mares are the chief problem. Obstinate cases may be treated by implanting 1 g. of stilboestrol under the skin and leaving for several weeks, but much time is lost in waiting until the ovaries are restored to normal after the removal of the implant.

Ovarian dysfunction provides the greatest problem. Mares may be anoestrous with or without follicle development ; and about 70 % of the former cases will respond within 48 hours to an injection of 10-15 mg. of stilboestrol in oil ; the latter is a difficult condition to treat, but may be avoided by ensuring that the mares are in rising condition at the time of service. True cystic ovaries, in which 30-40 cysts are found in each ovary, cannot at present be treated with any hope of success.

Some foaling mares may be anoestrous during lactation, but very few will not show some signs at the "foal" heat.

Mares which give birth to or abort twins, cause considerable loss. In a recognized "twinner" rectal examinations are performed before service, and if two large follicles are detected one is allowed to ovulate and the other punctured *per vaginam*.

In answer to a question, B. stated that the optimum time to cover mares was from 48 hours

before and up to the time of ovulation, and that the Russians claimed to have obtained good conception results up to ten hours after ovulation.

—J. O. L. KING.

LEIGHTON, R. E., & GRAVES, R. R. (1947.) **The relation of inclination of rump to inclination of udder, production ability and breeding efficiency.**—*J. Dairy Sci.* 30. 25-40. 1661

It has been suggested that a slope of the rump in cattle is responsible for a tilted udder with consequent lowered milk capacity, difficult calving and lower breeding efficiency. The authors give figures of these angles of inclination which they recorded in 138 cows photographed at intervals at ages from 1-8 years under standard conditions of measurement.

It was found that a parallel slope of the udder occurred and that both this slope and that of the rump increased with age, the greatest increase being in the lower age groups. Udder slope, however, was more pronounced than could be accounted for by change in the rump slope alone. There was no significant evidence to relate this with udder capacity, nor could it be associated with difficult calving.

It was, however, possible to demonstrate these features as inherited factors, although independent one of the other, and that the average slope in progeny could be predicted with some certainty.—C. W. OTTAWAY.

POLDING, J. B., & LALL, H. K. (1945.) **Some genital abnormalities of the Indian cow and buffalo, with reference to the anatomical differences in their reproductive organs.**—*Indian J. Vet. Sci.* 15. 178-182. 1662

Comparative anatomy was studied and measurements of the reproductive organs in the two species are tabulated. Pathological conditions are dealt with separately, *i.e.*, metritis, cervicitis and tubal and ovarian abnormalities. The most common of these were chronic metritis in cows, tubal disease (one or both tubes blind, pneumosalpinx) in buffaloes, and ovarian lesions (dermoids, cysts) in buffaloes. Details are given of the organs, including the ovary at different stages of the ovarian cycle, and there are good plain and coloured illustrations.—F. C. MINETT.

THYGESEN, A. S. (1949.) **Adhaerencedannelser i ovarieregionen som årsag til sterilitet hos kvæget. [Adhesions in the ovary region causing sterility in cattle.]**—*Maanedsskr. Dyrlæg.* 60. 261-272. [Abst. from English summary.] 1663

The author establishes that adhesions in the ovarian region in cows are a frequent finding at abattoir examinations. The present examinations cover genitalia from 1,614 cows, in 142 of which there were adhesions in the ovarian region. The

adhesions were bilateral in 33 cases, unilateral (right side) in 77, unilateral (left side) in 82. Absolute sterility was demonstrated in 30 cases of bilateral adhesions. As to the 109 unilateral adhesions the author concludes that the breeding prospects for animals with unilateral sterility are decidedly poor. He does not advocate treatment of the lesion, but attaches great importance to elucidation of the aetiology.

Observers in other countries point to endometritis, tuberculosis, rough rectal manipulations and injection of irritant solutions into the uterine cavity as important aetiological factors.

T.'s findings indicate that treatment with iodine, manual expression of the corpus luteum and other rectal manipulations—besides endometritis resulting from retention of the placenta, abortion, etc.—play an important role in the origin of the adhesions.

GRANGER, W. (1947.) **Conception in lactating ewes.**—*Aust. vet. J.* 23. 143-145. 1664

Eighty-three lactating Merino ewes were paddock mated within five weeks of parturition; 55 gave birth to lambs, two died pregnant and 26 did not bear lambs. Mating took place at the height of the breeding season. The conception date was calculated by subtracting 151 days from the date of lambing. The period from the previous lambing to the calculated conception date ranged from 29-61 days. G. concluded that conception occurred in those sheep mated, as early as in the fifth week after parturition; no ewe conceived, however, within 8-9 days of mating and the presence of the ram may have influenced the onset of oestrus. [G. does not consider the possibility of prolonged gestation during lactation in the sheep which has been observed in the mouse. Unfortunately the figure referred to by G. was not published with the article.]—W. K. W.

MOULE, G. R. (1948.) **Fertility and infertility of sheep.**—*Qd. agric. J.* 66. 274-286; & 353-365. 1665

After describing the process of reproduction in the ewe, the author discusses the various female aspects of fertility. The greater fecundity of British breeds in comparison with the Merino is mentioned. The increase of twinning rate with maturity of the ewe and the increase in percentage of deaths attributable to lambing after full maturity are noted. The breeding season of ewes in Australia, commencing in midsummer and continuing throughout the autumn and winter, is probably controlled to some extent by the amount of daylight to which the sheep are subjected. The presence of rams amongst ewes which have not been mated for a considerable time may have some effect in stimulating oestrus in the non-breeding season.

The anatomy and physiology of the male reproductive organs are briefly outlined. The characters of normal semen are enumerated together with causes of temporary and permanent infertility of the ram.

In describing the Queensland pastoral environment, the state is divided into areas in relation to two factors, the effectiveness and reliability of rainfall. Areas are classified as being good to fair, mediocre, or bad for sheep raising. The main sheep raising areas of the south-west, north-west, and parts of the central west appear in a rather unfavourable light under this classification.

The state is also divided into areas according to the number of months of the year in which the average maximum temperature is 95°F. or over (deleterious to spermatogenesis in rams). The areas which experience the prolonged summer heat correspond with a large part of the state which has a high proportion of mediocre seasons. The influence of prevailing vegetation in offsetting the effect of the mediocre seasons is pointed out.

The necessity for examining rams for genital soundness, when selecting, is emphasized. Adequate shade and feed must be provided. Frequent shearing to minimize the risk of fly strike and to keep rams cool is recommended.

In choosing a mating time, it is sometimes difficult to strike a compromise between the two criteria of the time to ensure maximum chance of survival of the lambs and their dams, and the time at which maximum fertility of ewes and rams is obtained.

Care of ewes in lamb includes the control of blowfly strike, and adequate attention to nutrition. The causes and prevention of deaths in young lambs are outlined.—C. S. SAMPFORD.

CHANG, M.-C. (1948.) **Transplantation of fertilized rabbit ova: the effect on viability of age, in vitro storage period, and storage temperature.** [Correspondence.]—*Nature, Lond.* 161. 978-979. 1666

Ova 1-4 days old from superovulated rabbits were transplanted into does stimulated by gonadotrophin injections 1-4 days previous to implantation. Before transplantation the ova were maintained in rabbit serum at 30°, 10°, 0° or 38°C. for periods from 1-96 hours.

Surviving young as percentage of ova transplanted are tabulated. C. concluded that the younger the ova were, the better was the chance of survival; 10°C. was the optimum storage temperature and storage did not initiate abnormal differential sex survival.—ARTHUR W. MARRABLE.

SCHOTTERER, A. (1942.) **Fragen der Erbanalyse.** [Hereditry.]—*Wien. tierärztl. Mschr.* 29. 529-534. 1667

The principles of heredity are discussed, especially in regard to teratology.

Goldschmidt's work with the gipsy moth indicates that both genetical and environmental conditions may be concerned. The development of the freemartin is cited as an example of the effect of environmental conditions, occurring at the appropriate stage in the development of the foetus, on the production of abnormality of the genital system.—E. V. L.

HABEL, R. E. (1948.) **On the inheritance of metatarsal inclination in Ayrshire cattle.**—*Amer. J. vet. Res.* 9. 131-139. 1668

The conformation of the limbs is of importance in show cattle and a study of the inheritance of faulty conformation has been made in Ayrshire herds in Ohio. The inclination of the metatarsus to the horizontal was measured by a technique which is described. No bulls were measured. It was concluded that the inclination of the metatarsus was highly heritable and determined by multiple factor inheritance.—M. C.

MAKINO, S. (1944.) [**On the sex chromosomes of *Bos taurus*, *Sus scrofa* and *Rangifer phylarchus*.**—*Jap. J. Genet.* 20. pp. 90. [In Japanese.] [Abst. in *Anim. Breed. Abstr.* 16. 202. (1948), copied *verbatim*.] 1669

The diploid chromosome number in *Bos taurus* is 60, and in *Sus scrofa* 40. Sex determination is of the XY type in both species. The X-chromosome is represented by a large rod and the Y-chromosome by a small dot. There is no difference in the chromosome morphology in different breeds. The sex determination of *Rangifer phylarchus* is probably also of the XY type, X being a large rod and Y a large V-shaped chromosome.

BRYANT, R. L. (1946.) **Breeding Leghorn chickens to increase the life span.**—*Va Sta. Tech. Bull.* 99. 8. [Abst. in *Exp. Sta. Rec.* 95. 710. (1946), copied *verbatim*.] 1670

See also absts. 1593 (nutrition and fertility); 1594 (nutrition and birth weight); 1632 (hyaluronidase and fertilization); 1706 (reproduction and survival); 1707 (obstetrics in cattle and horses).

ZOOTECHNY

VELASQUEZ, Q. J. (1947.) **Enfermedad de las alturas. ["Altitude" disease. (Cardiac insufficiency in animals imported into Colombia, caused by high altitude).]**—*Rev. Med. vet., Bogotá.* 16. 53-70. 1672

In 1945, 500 head of cattle were imported from the U.S.A. and placed on the savannahs at 2,600 m. altitude. After two or three months they began to cough and had oedema of the chest, ascites and general weakness, but no rise of temperature. Many died. The author attributed

An experiment was conducted to determine the feasibility of selective breeding to increase the length of life of Single-Comb White Leghorn chickens. From the original stock of 105 females, two strains were established, one bred for a low percentage of deaths and the other bred for a high percentage of deaths.

Eliminating birds which died from accidents, the deaths during the starting period, 1 day to 8 weeks of age, amounted to 8.05 percent for the shortlife strain and 3.39 percent for the long-life strain. During the growing period, 8 to 20 weeks of age, the nonaccidental deaths were 3.99 and 2.50 percent, respectively, and during the laying period, 140 to 525 days of age, they were 29.66 and 17.07 percent, respectively. By the end of the 5-yr. breeding period the average length of life, based on a maximum length of life of 525 days, was 43.9 days greater for the birds in the long-life strain than for those in the short-life strain.

The experiment is deemed to show that resistance to disease and length of life of the domestic fowl can be influenced by selective breeding and progeny testing.

HANSEN, H. J. (1944.) [**Some cases of *Perocephalus aprosopus synotus* in domestic animals.**—*Skand. VetTidskr.* 34. 423-434. [English and German summaries.] 1671

Three cases of *perocephalus* are described in detail and illustrated by photographs: a nearly full-term foetus from a cow slaughtered in emergency, and the neck and "skull" portions from a new-born full-term calf and from a new-born full-term lamb.

The calf foetus was externally normal in other respects, but the head was missing, the neck narrowing and terminating anteriorly in two ear muscles lying close to each other ventrally. Section revealed a microcranium about the size of a hen's egg. H. reviews the literature on the subject and discusses the aetiology.—F. E. W.

these symptoms to cardiac insufficiency due to the high altitude; the symptoms being aggravated by deficient food, the hot summer and long and mountainous journeys. Sarcosporidia were found to be abundant in the carcasses and may have exaggerated the trouble; so also may the vaccinia prevalent in the herd.

Imported horses may suffer in a similar manner if worked before becoming acclimatized. In these the symptoms are dyspnoea, colic and thromboses, particularly in the branches of the

posterior aorta. If given no work for three months and a liberal diet they will become acclimatized, as they are generally less susceptible than cattle. Goats seem to be even more susceptible than cattle, and so do sheep, the latter having their powers of reproduction seriously damaged. Asses are also more susceptible than horses.

—R. MACGREGOR.

GUTHRIE, J. E. (1947.) **An improved chemical dehorning agent for young calves.**—*Vet. Med.* 42. 284-288. 1673

A study of various caustic agents was made. The authors concluded that a mixture of 28% antimony trichloride, 7% salicylic acid and 65% collodion was most effective. A small area round the horn bud was clipped and brushed and the agent painted on. It proved much less irritant than agents normally used, dried on rapidly and was therefore less dangerous to the dam and could not easily be removed by the calf. There appears to be no toxic effect and the author advocates its use in calves up to 14 days old.—G. V. LAUGIER.

ALLEN, C. G. (1948.) **The Benjamin Ward Richardson lecture. The transport, handling, and lairage of animals intended for slaughter.**—*J. R. Sanit. Inst.* 68. 108-118. 1674

The transport of animals from the farms to the abattoirs is described and the need for closer veterinary supervision at all stages is emphasized. More veterinary inspectors are needed and they should have greater powers to detain weakly animals, such as very young calves or cows about to calve, as well as sick and injured ones. Such animals should be segregated and sent to the nearest abattoir for emergency slaughter. Unnecessary suffering as well as actual losses are inflicted by the use of ramps with insecure side rails; the use of double deck road vehicles for small animals, when the lower deck is improperly ventilated; and the use of sticks and goads instead of electric coaxers which can never harm the animal. Horses are rarely properly catered for, as only recently have they been considered as food animals. In the day-old chick trade steps should be taken to avoid chilling when exposing the birds for sale; and they should not be sold as playthings for children.—R. MACGREGOR.

FABROVICH, F. (1948.) **Macellazione rituale ebraica e zoofilia. [Jewish ritual slaughter and zoophilia (humane treatment).]**—*Clin. vet., Milano.* 71. 217-226. 1675

A discussion of Jewish ritual slaughter. Contains nothing new.—E. G.

See also absts. 1439 (dipping and *Erysipelothrix* infection); 1657-1659 (artificial insemination); 1708 (cattle husbandry).

TECHNIQUE AND APPARATUS

GLASSMAN, H. N. (1948.) **Surface active agents and their application in bacteriology.**—*Bact. Rev.* 12. 105-148. 1676

In this review the chemical structure and physical properties of surface active agents generally are presented. A selected list of commercial surface active agents is given and their names, manufacturers, chemical description and physical properties are listed. The relation between the structure of surface active compounds and their function is discussed and the effects of these agents on proteins are particularly pointed out. A special paragraph is devoted to the interaction between these agents and isolated biological systems such as enzymes, toxins, erythrocytes and bacterial growth. The important bacteriostatic and bactericidal activities of the agents in question, their evaluation and the theory of their antibacterial effect are discussed. The difficulties of assessing their interaction with viruses is pointed out. The last paragraph is devoted to the application of surface active agents to problems of sanitation.—E. K.-N.

MARSHALL, E. K., Jr., BLANCHARD, K. C., & BUHLE, E. L. (1947.) **Colorimetric methods**

for determination of streptomycin.—*J. Pharmacol.* 90. 367-374. 1677

The authors describe a method based upon the interaction of the carbonyl group of streptomycin with a coloured semicarbazide (4-(4-(*p*-chlorophenylazo)-1-naphthyl) semicarbazide, the preparation of which is described) and subsequent colorimetric determination of this derivative. This method is satisfactory for streptomycin determinations in plasma and in aqueous solutions.

Urine, however, contains interfering substances and the authors have developed a method based on the reaction of maltol, formed by alkaline degradation under controlled conditions, with solutions of ferric nitrate (in excess) when intensity of the violet colour formed is directly proportional to the maltol content and therefore to the original streptomycin content. The coloured products formed by substances in urine and ferric salts are circumvented by extracting the maltol in chloroform, a procedure which concentrates the maltol at the same time and enhances the sensitivity of the method as the ferric nitrate solution may be added directly to the chloroform extract. This method is applicable to aqueous solutions also.

The methods give good agreement with one another and with calculations of streptomycin content based on solvent content, nitrogen content and bioassay.—MALCOLM WOODBINE.

HABEL, K., & SOCKRIDER, B. T. (1947.) **A continuous flow method of exposing antigens to ultraviolet radiation.**—*J. Immunol.* 56. 273-279. 1678

A detailed description is given of the construction of an apparatus for exposing bacterial and virus suspensions to ultra-violet irradiation. The principle involved is the creation of a thin film of the suspension by passing it through a continuously revolving cylinder slightly tilted so that the liquid material can flow from one end to the other. The source of ultra-violet light is an ordinary 15-watt low-pressure resonance lamp placed through the centre of the revolving cylinder. The thin film of material coating the inner wall of the cylinder thus receives direct ultra-violet exposure throughout its passage, the speed of which can be varied by adjusting the rate of flow into the cylinder and by altering the angle at which the cylinder is tilted.—W. M. HENDERSON.

HANSEN, A. (1948.) **Preparation of purified antitoxins.**—*Acta path. microbiol. scand.* 25. 460-484. [In English, abst. from summary.] 1679

A detailed description is given of the preparation of purified antitoxins from the blood of immunized horses, and also of the apparatus and reagents used.

The blood is mixed with bentonite, blood corpuscles and fibrin being removed by centrifuging. The solution of serum proteins is submitted to proteolysis with pepsin in acid medium. The unspecific protein is removed from the solution by adsorption with aluminium hydroxide gel and the solution of antitoxin-carrying protein is concentrated by ultra-filtration, salting-out and dialysis.

The preparations thus obtained are of pure pseudoglobulin character. They are tolerated well when administered to patients and on storage, even for years, they remain unchanged, the solutions being clear and without sediment.

GORDON, I. (1947.) **Improved guns for the delivery of liquid D.D.T. spray and powder by mechanical compressors.**—*J. Hyg., Camb.* 45. 173-175. 1680

The spray-gun described is slung over the shoulder and has a reservoir holding half a gallon or more. It is worked by compressed air at pressures of under 30 lb. per square in., and is easier to operate without fatigue than the paint or oil spray-guns previously used. The handle

of the gun is beneath the container instead of behind it as in the horticultural-type gun previously used. A power-operated dust gun is also described.—L. DAVIES.

WOLFENBARGER, D. O. (1946.) **Observations on the airplane for the application of sprays and dusts.**—*J. econ. Ent.* 39. 503-505. 1681

Slides exposed in the path of an aircraft showed that more spray droplets or dust particles fell directly under the plane and progressively less towards the margin of the swathe covered, and that the upper surfaces of slides received 90% of the spray droplets and the lower surfaces only 10%. The need for more research on the distribution of insecticides from aircraft in relation to the type of crop and the actual pest or pests involved is stressed.—L. DAVIES.

PIJPER, A. (1947.) **The diffraction method of measuring red blood cells.**—*J. Lab. clin. Med.* 32. 857-877. 1682

P. describes a "blood cell tester" with which, by passing a beam of white light through blood films the diffraction pattern of two films can be examined and compared simultaneously on one screen. Besides comparing at a glance abnormal with normal, the mean, maximum and minimum erythrocyte diameters can be measured easily. A conversion table is given. The method is far less laborious than that of Price-Jones and, according to P., less liable to personal error.—L. M. M.

VAN CLEAVE, H. J., & ROSS, J. A. (1947.) **Use of trisodium phosphate in microscopical technique.**—*Science.* 106. 194. 1683

The authors recommend this agent in the process of fixing, clearing and mounting helminth specimens, particularly *Acanthocephala*. They also found it extremely useful in reclaiming old, dried specimens. Entire histologically-fixed organisms become much softened and there is no apparent damage.—L. M. MARKSON.

STRUGGER, S. (1948.) **Fluorescence microscope examination of trypanosomes in the blood.**—*Canad. J. Res. Sect. E.* 26. 229-231. 1684

The source of light is a carbon-arc lamp with a convex lens. With the necessary filters, examination can be made with an ordinary microscope. When the dye acridine orange is used the trypanosomes are visible as shining bright green bodies; the erythrocytes are not visible. With the fluorescent dye auramine, trypanosomes in the blood may be selectively stained. Even in difficult cases a decision on the presence of trypanosomes in blood is possible.—THOMAS MOORE.

CAMAIN, R. (1947.) **Sur une similitude d'affinités**

tinctoriales. Limitation des résultats donnés par la coloration des rickettsies au Machiavello et au Giemsa bouillant. [Similarity of staining affinities. Limitations of the results obtained by staining rickettsia with Machiavello's and with very hot Giemsa stains.]—*Bull. Soc. Path. exot.* 40. 325-326. 1685

An attempt to discover cytoplasmic inclusions, possessing staining affinities similar to those of rickettsia, in *Trypanosoma gambiense* in films of murine blood. Granules were demonstrated, whose staining affinities by these methods were sufficiently similar to those of rickettsia as to show a weakness in the claim that by these methods of staining rickettsia could be clearly differentiated from other micro-organisms.

—L. M. MARKSON.

BOURDON, P. (1942.) Sur l'emploi de la cyclohexanone comme agent déshydratant et éclaircissant en technique histologique. [Use of cyclohexanone as dehydrating and clearing agent in histological technique.]—*Bull. Histol. Tech. micr.* 19. 55. [Abst. in *Stain Tech.* 21. 116. (1946), copied *verbatim*. Signed: JEAN E. CONN.] 1686

Cyclohexanone can be used satisfactorily for dehydration and clearing instead of the traditional absolute alcohol followed by xylene or toluene. This saturated cyclic ketone has a number of advantages: a high boiling point (140°C.), a low melting point (-40°C.), a density close to that of water, miscible with organic solvents and paraffin, only slightly inflammable, non-toxic, and does not harden the tissues.

The procedure used is as follows: Fix and wash tissues as usual. Partially dehydrate in 95% alcohol for 12 hr. Dehydrate and clear in two successive baths of cyclohexanone, the first for 4 hr., the second for 2 hr. Impregnate in two baths of paraffin for 2 hr. or less each. This is satisfactory for pieces 3 mm. thick; for larger pieces more time would be required for each step. The same series of solutions could be used for the dehydration of sections after staining.

PRAT, J. (1946.) A propos de la séro-formol-gélification utilisée comme épreuve-diagnostique en médecine-vétérinaire. [The use of formol-gel tests of serum for diagnostic purposes with animals.]—*Rev. Path. comp.* 46. 593-605. 1687

The methods of carrying out the formol-gel test, its value as a diagnostic test in certain diseases (leishmaniasis, etc.), and the alterations in the serum favouring gel formation are discussed.

With the sera of normal cattle, P. found that the optimum proportion of formalin was 2 drops to 20 drops of serum, which with the pipette used was equal to 1 ml. The presence of haemoglobin

in the serum seemed to favour early gel formation, but the age of the serum did not appear to affect the result.

A method of measuring the viscosity of serum is described, but the slight variations recorded were not considered sufficient to explain different rates of gel formation.

It is concluded that the formol-gel test is not specific and that it appears to depend on a disequilibrium of the proteins in favour of the globulins, a condition which occurs in many diseased states, and is not dependent on any modification in the physical properties of the serum.

—U. F. RICHARDSON.

STRUGGER, S., & ROSENBERGER, G. (1944.) Vitalfärbung der Ziegenspermatozoen mit Akridinorange. [Vital staining of goat spermatozoa with acridine orange.]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 357-359. 1688

Acridine orange is dissolved in Milovanow's glucose-phosphate solution to a dilution of 1:1,000. This is further diluted with the glucose-phosphate to dilution of 1:20,000, 1:40,000 or 1:60,000. The semen is then mixed with this solution to a dilution of from 1:1 to 1:8. Staining of the spermatozoa is almost immediate. A fluorescent microscope is used to examine the stained cells. Twenty-seven female goats were artificially inseminated with semen vitally stained in this way. Twenty-one conceived and brought forth healthy kids.—L. M. MARKSON.

HEDÉN, C. G. (1946.) On the estimation of fifty per cent. end-points in serological titrimetry. —*J. Path. Bact.* 58. 477-481. 1689

It is customary to grade the degree of agglutination in a Widal test from 1 to 5, and to regard as the titre of the serum the dilution in the last tube giving a fair amount of agglutinate and corresponding to grade 3. This figure contains a large error, as the degree of agglutination in the other tubes is not taken into account. In analogy to the 50% end-point used in the titration of toxic and of therapeutic substances H. calculates a 50% end-point for the titre of an agglutinating serum. For this calculation the degree of agglutination in the last four tubes showing any agglutination at all is taken into account. An index figure is thus arrived at which, when multiplied by the serum dilution in the first of the four tubes, gives the 50% end-point. A table is appended, giving the already calculated index figures for any combinations of figures that may occur as gradations for the last four tubes with visible agglutination.

—A. MAYR-HARTING.

HUSS, J. H., GILBERT, J., & LIEBOW, A. A. (1948.) A method for obtaining bone marrow by

vertebral spinous process puncture.—Yale *J. Biol. Med.* 20. 291–297. [Summary and conclusions copied *verbatim*.] 1690

A method of obtaining bone marrow from the spinous processes is described which is more convenient both for the patient and operator and less dangerous than is the sternal puncture. Marrow comparable to that from the sternum may be obtained, although there is considerable variation in the differential counts, as there is in successive sternal punctures from the same patient. Vertebral puncture has additional value for the detection of tumour cells metastatic from the prostate or other organs.

See also *absts.* 1702 (blood coagulation); 1703 (laboratory technique in biology and medicine).

SMITH, W. E., & PENNELL, R. B. (1947.) **Reducing the pyrogenicity of concentrated protein solutions.**—*J. Bact.* 54. 715–718. 1691

The pyrogen content of serum, plasma and haemoglobin solutions (6–8% protein) and of serum albumin solution (25% protein), was reduced to a safe level by the combined use of “decalso”, an ionic exchange agent, and a new type of Seitz pad (Republic Filter K-6 or S-6). Adequate reduction of pyrogenicity was usually obtained by allowing 30 g. per l. of the ionic exchange agent to act in the cold, followed by filtration through 40 sq. in. of pad surface per l. of solution.—J. KEEPIE.

MISCELLANEOUS

ANON. (1945.) Skandinaviska Kreatursförsäkringsbolagets Verksamhet. 1890–1945. [The Activities of the Scandinavian Livestock Insurance Company.] 1890–1945. pp. 126. Uppsala: Almqvist & Wiksells Boktryckeri Aktiebolag. 1692

This is one of a number of periodic progress reports of the company written for farmers with special reference to operations and scientific advances made in the five-year period up to 1945. A steady increase in livestock insurance in Sweden and in this company's share in it has taken place; thus 263,000 out of 604,000 horses were insured in 1945 and 52% of them with the company; and 687,000 cattle were insured, 83% with the company. During the last half-decade 19 local insurance companies were merged into the company, a familiar trend in its history. Figures on premium income, etc., are given.

The bulk of the publication is devoted to two main themes—accounts of insurance and compensation for loss of horses, cattle, pigs, dogs and crops (from hail); and scientific articles by leading Swedish veterinarians on eight diseases of

current importance. In the first part a wealth of information is given on livestock population during a 50-year period, losses sustained and so on. Special sections are devoted to roaring, canker of the hoof and tetanus in horses and a table deals with losses of horses from all causes, suitably classified. Shorter and more general reports are given for cattle, pigs and dogs.

The scientific articles deal with:—pedigrees of the Ardennes and North-Swedish breeds of horses, by K. Eriksson; a review of losses among stallions between 1936 and 1945, by G. Forssell; notes on a nutritional disease spoken of as “skravelsjuka” and on digestion in the rumen of cattle, by H. Hedström & S. Hoflund; leucosis, especially in cattle, by A. Hjärke & A. Isaksson; equine infectious anaemia, by B. Jeppsson; causes of insurance loss in breeding bulls, by N. Lagerlof; losses of pigs, by H. Sandstedt; and the soil in relation to animal production, by O. Svanberg.

This report is full of interest for veterinarians, and it is beautifully produced.—J. E.

REPORTS

CANADA. (1947.) **Report of the Science Service. Dominion Department of Agriculture for the year ended March 31, 1947.** pp. 105. Ottawa: Reprinted from the report of the Ministry of Agriculture for the year ended March 31, 1947. Items of veterinary interest pp. 23–26, 98–99. 1693

Work of the Division of Animal Pathology is classified under Research, Services, and Manu-

facture of Biological Products. The subjects reported briefly under Research are INFECTIONOUS MASTITIS of cattle, infectious abortion (BRUCELLOSIS), COCCIDIOSIS of chickens, PULLORUM DISEASE of chickens, TRANSMISSIBLE LEUCOSIS of fowls, RHINITIS of swine and tuberculin studies. Under laboratory services are listed serological tests for brucellosis and pullorum disease and miscellaneous specimens examined by the various Research

Laboratories. Tuberculin, mallein, johnin, *Brucella abortus* and *Salmonella pullorum* antigens are manufactured and distributed to those concerned with the diagnosis and control of animal diseases. Scientific papers published during the year are listed and include 21 from the Animal Pathology Division.

The work of the Division of Bacteriology and Dairy Research is described. In the work of the Division of Entomology livestock investigations are dealt with; also household and medical entomology.—R. GWATKIN.

SOUTH AUSTRALIA. (1947.) **Ninth annual report of the Council of the Institute of Medical and Veterinary Science, July 1946-June 1947.** pp. 16. Adelaide: K. M. Stevenson, Govt. Printer. 1694

In the Department of Bacteriology studies were continued on antibacterial substances produced by fungi. Extracts of an edible mushroom (*Psalliota exanthoderma*) were found to have antibacterial effects against human type tubercle bacilli, *Bact. typhosum* and *Staph. aureus*. Other investigations dealt with salmonella strains, mycobacteria, including testing of BCG vaccine, *Actinomyces*, pleuro-pneumonia-like organisms in cases of arthritis, and *Pseudomonas* from various sources including human and animal, water and cold-stored foodstuffs.

In the Virus Department observations were made on KAPOSÍ'S VARICELLIFORM ERUPTION, RUBELLA and congenital malformations and infectious diseases as a cause of still-births.

In the Department of Biochemistry excretion of nicotinic acid derivatives in urine was studied. LEUCAEMIA was the chief study in the Department of Clinical Pathology and the effects of thiouracil and urethane were observed. OSTEOPETROSIS of fowls was compared with similar conditions in man.

The Department of Experimental Medicine was concerned chiefly with PRIMARY ATYPICAL

PNEUMONIA; histamine and antigen; ischaemia, anoxaemia and shock; anti-coagulant from the liver; heparin and toxicity of snake venom.

In the Department of Veterinary Pathology studies were continued on "STAGGERS" IN SHEEP. Topdressing with complex mineral mixtures prevented "STAGGERS" IN SHEEP AND CALVES grazing young growing rye grass pastures. Cases of MUSCULAR DYSTROPHY IN LAMBS conformed to descriptions of the dystrophy caused by VITAMIN E DEFICIENCY.—H. McL. GORDON.

SOUTHERN RHODESIA. (1947.) **Report of the Division of Entomology for the year ending 31st December 1947.** [MOSSOP, M. C.]—*Rhod. agric. J.* 45. 230-248. (1948.) [Items of veterinary interest pp. 237-245.] 1695

Organized large-scale game shooting has effectively decreased tsetse fly density (mainly *Glossina morsitans*) in S. Rhodesia. Some of the smaller game can now safely be spared, but the general policy must be continued unless an equally effective and less undesirable method can be devised.—BERYL A. THURSTON.

URUGUAY. (1948.) **Memorias Primer Congreso Nacional de la Brucelosis 15-17th December 1947. [Proceedings of First National Congress on brucellosis, 15-17th December, 1947.]** [ANON.] pp. 566. Montevideo: Letras, S.A. 1696

This is a report of a Conference held at Montevideo. In addition to the Uruguayan representatives there were delegates from Argentina, Brazil, France, Italy and the U.S.A.

The report is divided into two parts each containing a number of sections. The first part deals with BRUCELLOSIS in animals and the second with the disease in man. The whole furnishes a good overall picture of present-day knowledge, particularly of the disease as it occurs in South America.

The more important papers of veterinary interest are abstracted separately.—M. C.

BOOK REVIEWS

BRADLEY, O. C. [M.D., D.Sc., F.R.C.V.S.]. Edited by GRAHAME, T. [T.D., F.R.C.V.S.]. (1948.) **Topographical anatomy of the dog.** pp. xii + 319. Edinburgh & London: Oliver & Boyd. 5th Edit. 30s. 1697

This edition of Bradley's Dissection Guide of the Dog differs little from the fourth edition published by Grahame in 1943. G. has, however, taken the opportunity to add to the number of radiograph plates illustrating both visceral and skeletal structures.

Radiographs have now an accepted place in anatomical literature and due credit must go to

Grahame for so enriching this book, which is already recognized as an excellent guide both for students and in advanced study.—C. W. O.

HENTSCHEL, C. C. [M.Sc. (Lond.); Senior Lecturer in Zoology, Chelsea Polytechnic] & COOK, W. R. I. [B.Sc., Ph.D. (Lond.); Lecturer in Botany, University College, Cardiff]. (1947.) **Biology for medical students.** pp. xii + 752. London: Longmans, Green & Co. 4th Edit. 25s. 1698

The publication of four editions and six reprints within 15 years is proof of the popularity of this useful manual. We like its cheerful bind-

ing, the wealth of its helpful and largely original illustrations, its conscientiously compiled index, and its glossary of prefixes and suffixes. While it contains everything a medical student will need for examination purposes, it is sufficiently stimulating to arouse in him a real and abiding interest in biology.—W. R. BETT.

SCHER, B. T. [Ph.D.; Assistant Professor of Biochemistry and Lecturer in Zoology, University of Southern California]. (1948.) **Comparative physiology**. pp. x + 563. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Ltd. 36s. 1699

This book is primarily intended for advanced students of comparative physiology and zoology and deals with the animal kingdom as a whole. After a general outline of the underlying principles of physiology, the different phyla are considered separately; nutrition, feeding, digestion, circulation, respiration, metabolism, excretion, regulation of the internal environment and the neuromuscular system being dealt with in the same order for each phylum. A convenient summary of the chief characteristics of the phylum is given at the end of each section.

The author is to be congratulated on having compressed such a large subject into so eminently readable a book. The processes of life are clearly described and the special physiology of the different animals is adequately dealt with, without overburdening the text. Even a cursory perusal of the book shows that fundamentally there is only one physiology. For example, nervous tissue and muscular tissue are essentially similar throughout the animal kingdom, and again, common enzyme systems are found, such as those concerned with anaerobic glycolysis by means of phosphorylation which is used by bacteria as well as by higher animals, or oxygen transfer in tissue oxidations by means of cytochromes and related compounds. Veterinary readers, particularly those who wish to broaden their outlook on the mechanisms of life, will therefore find the book of considerable interest.—J. A. NICHOLSON.

DE ROBERTIS, E. D. P. [M.D.; Dept. of Biology, Massachusetts Institute of Technology], NOWINSKI, W. W. [Ph.D.; Dept. of Anatomy, University of Texas Medical School], & SAEZ, F. A. [Ph.D.; Institute for the Investigation of Biological Sciences, Montevideo]. (1948.) **General cytology**. pp. xi + 345. London & Philadelphia: W. B. Saunders Co. 27s. 6d. 1700

This book will serve as a useful introduction to modern cytology, for the authors have covered a wide field and have collected in a small volume a mass of recent information concerning its various

aspects. The subject is treated under the main headings of chemistry, morphology, physiology and genetics.

The book opens with a brief historical review which is followed by a summary of the chemical composition of the cell and its importance as a colloidal system. The morphology of the cell, the cytoplasmic inclusions and the nucleus are dealt with separately from the microscopic and submicroscopic aspects. Cell division and cytogenetics are treated in detail. There is an important chapter on the plasma membrane and cell permeability. Also mentioned are the enzymes, respiration, the visible manifestations of cellular activity and death.

Although tissue culture, micro-surgery, the micro-measurement of oxygen consumption of tissue, the electron microscope and special methods of fixation and staining are mentioned, the techniques are not given in detail. However, a comprehensive bibliography at the end of each chapter will assist anyone in search of further information. The text is well illustrated with photographs and diagrams.—M. M. SHEAHAN.

ALLEN, A. C. [M.D.; Consultant Pathologist, Army Institute of Pathology]. (1947.) **Atlas of medical diseases of the kidney**. pp. 92. Washington, D.C.: Registry Press, American Registry of Pathology, National Research Council. 1701

A series of 68 photomicrographs of lesions of the human kidney, along with brief summaries of the clinical history and pathology of each specimen.

The photomicrographs are well reproduced on good paper. Although none of the specimens are from the domestic animals the veterinary pathologist will find much of interest in this collection.—M. C.

RIEBEN, W. K. [Professor of experimental medicine at the University of Oregon]. (1947.) *Beiträge zur Kenntnis der Blutgerinnung*. [**Blood coagulation technique**.] pp. 96, 26 figs., 13 tables. Basle: B. Schwabe & Co. Swiss Fr. 9. 1702

This small monograph critically examines the problem of plasma prothrombin determination, describes a new two-phase method, particularly suitable for quantitative work, and details experimental evidence for the action of *l*-ascorbic acid, *l*-dehydro-ascorbic acid, and cysteine on prothrombin. The text is illustrated with charts and tables and has useful summaries and international bibliographies.—W. R. BETT.

COWDRY, E. V. [Professor of Anatomy, Washington University, and Director of Research, The Barnard Free Skin and Cancer Hospital, St. Louis]. (1948.) **Laboratory technique in**

biology and medicine. pp. vi + 270. Baltimore: The Williams & Wilkins Co.; London: Bailliere, Tindall & Cox. 2nd Edit. 22s. 1703

This book is the second edition of the author's "Microscopic Technique in Biology and Medicine". The subject has been expanded to include physical, microchemical and other related techniques, making it a most useful compendium. The inclusion of methods, tissues, stains, etc., in one alphabetical arrangement makes for easy reference.

In most instances techniques are given in sufficient detail to enable them to be followed and where this has not been possible the reader is told where further information is to be found. Under the various tissues, suggestions are made as to suitable methods of examination. That the book is up to date can be gauged from the fact that nearly five pages are devoted to the use of radioactive isotopes as tracer elements in experimental biology.—J. RICHARD HUDSON.

EHRLICH, C. (1948.) Die Aufzuchtkrankheiten der Jungtiere. [**Diseases of young animals.**] pp. 136. Hiltrup bei Münster i.W.: Landwirtschaftsverlag G.M.B.H. [5th Edit.] 1704

This book is intended for farmers. The first part deals with the nature of disease and hygienic measures for its prevention and the second part with infectious and parasitic diseases of foals, calves, piglets, lambs, kids and poultry.

The text is somewhat more highly technical than is usual for such a book and it must be said that many of the figures do not even show any definite disease at all; much less can they be said to illustrate without confusion the diseases alleged to be present—e.g., worm-infested foals in fig. 26.

Nevertheless, to well-informed livestock keepers the book should be very instructive.—J. E.

MEYER, O. (1948.) Fohlenaufzucht Fohlenkrankheiten. [**Rearing and diseases of foals.**] pp. 127. Hannover: M. & H. Schaper. 2nd Edit. DM. 6. —. 1705

The second enlarged edition of this booklet deals in brief with the problems of practical horse breeding. The major part is dedicated to the common foal diseases, their cause, course and control, also feeding, general hygiene, etc.; a comprehensive and useful summary is included with a comparatively large number of references. The appendix deals with the zootechnical analysis and the appraisal of the new-born. A useful little book for horse breeders.—E. G.

BROWN, R. C. [M.B., M.S., F.R.C.S., F.R.C.O.G.; Obstetric Surgeon, City of London Maternity Hospital]. (1948.) **Reproduction and survival.** pp. 108. London: Edward Arnold & Co. 6s. 1706

This little book is a discussion of parturition in women and its keynote is found in the statement in the preface that "Reproduction . . . is physiological only when viewed from the angle of the race, but not from that of the individuals participating. It is a racial process on which racial life and health depends". Thus a difficult birth leading to the death of the mother or of the child or of both may have evolutionary value. This is surely a concept meriting some attention by breeders of improved types of livestock? Death of the embryo may be due to inherited defects or to its reaction to an adverse environment. The uterus may become an adverse environment for the embryo if the elaborate hormonal mechanism controlling its development should be faulty, also should a rhesus positive foetus be growing in a rhesus negative mother, or should the mother become infected with certain viruses such as that of rubella.

The continuance and successful termination of gestation depends largely upon hormones produced by the corpus luteum; the author considers it likely that the corpus luteum requires a stimulus from the foetus for its continuance. Thus when the embryo is feeble there may not be sufficient chorionic progesterone and the result will be abortion. Where the embryo is vigorous hormones are abundant and there is adequate preparation for easy parturition as the uterine muscle is well developed, the cervix is adequately softened and the pelvic ligaments relaxed.—M. C.

BENESCH, F. (1947.) Die Geburtshilfe bei Rind und Pferd. [**Obstetrics of cattle and horses.**] pp. viii + 302. Wien: Urban & Schwarzenberg. 4th Edit. Sch. 30. —; Sw. fr. 15. —. 1707

This edition follows the third closely in layout and has been improved by the re-drawing of most of the figures. The book is divided into sections on general instructions for the management of parturition in cows and mares, together with instruction on epidural anaesthesia; obstetric bloodless operations for dealing with malpresentation; embryotomy; and after-treatment. The two middle sections form the *pièce de résistance* and give very detailed advice, admirably illustrated by partly schematic drawings on how to effect the delivery of calves and foals in case of dystocia of foetal origin. In embryotomy stress is laid on wire-saw procedures, which, incidentally, were a mainly German development.

This book has already achieved a good reputation through its earlier editions: this latest edition fully maintains the standard. Printing and binding are of high quality.—J. E.

ZORN, W. (1941.) Rinderzucht. [**Cattle husbandry.**] pp. 219. Stuttgart: E. Ulmer. 3rd

Edit. DM. 6.

1708

The purpose of this little brochure is to promote livestock breeding in Germany and to give stock farmers a condensed survey of standard German and other European breeds of cattle, their evolution, characteristics and output. The importance of the right selection of breeding-stock with regard to characteristics, parentage and production is emphasized. Common diseases of young and adult cattle, their prevention and control are mentioned very briefly. The sections on mating, sterility, artificial insemination, pregnancy, obstetrics, calf rearing, methods of feeding dairy cattle, breeding and fattening stock should be very useful as a guide to stock farmers in Germany.

—E. G.

ANON. (1948.) **Symposia of the Society for Experimental Biology. No. II. Growth in relation to differentiation and morphogenesis.** pp. vi + 365. Cambridge: The University Press. 35s. 1709

The 19 papers deal with the subject of growth both in plants and in animals.

The papers of especial interest to veterinarians are those by Grüneberg, H., on "Genes and pathological development in mammals"; by Woodger, J. H., "Observations on the present state of embryology"; by Young, J. Z., on "Growth and differentiation of nerve fibres"; by Gaillard, P. J., on "Growth, differentiation and function of explants of some endocrine glands". Of comparative interest is that by Wigglesworth, V. B., "The role of the cell in determination". Each of these articles provides a comprehensive review of the present state of knowledge on its subject.—M. C.

HANSEN, I. F. (1948.) **Investigations on agonal acidosis.** pp. 134. Copenhagen: Povel Braner. 1710

This monograph discusses the condition of death from a biochemical aspect. It is a careful study of 38 patients, whose case-histories are given in detail, and may be described as the first comprehensive biochemical survey of the agonal state, which will interest both clinicians and biochemists. Previous work on the subject is discussed, acidæmia is defined, the biochemical methods employed are detailed, and the results of analysis of blood collected just before or after death are given. Agonal fall of blood pH is often excessive and in certain cases may be a direct cause of death. Plasma bicarbonate concentration is reduced in only a third of the agonal cases, whilst marked increase in blood CO₂ tension is common and lactic acid content of plasma constantly increased. There is a bibliography of four pages.

—W. R. BETT.

HAMBURGER, J. (1948.) **Medical research in France during the war (1939-1945).** pp. 306. Paris: Editions Médicales Flammarion. 1711

This collection of 30 articles has been made in order to demonstrate how medical research was kept alive in France during the German occupation. As stated in the foreword "French medical thought did its best to remain what it had been in the past: alive with both invention and criticism, based upon clinical investigation".

The articles cover a variety of conditions of medical interest, few of which have any direct veterinary interest.—M. C.

BINKHORST, C. D. (1948.) **Toxoplasmosis. A clinical, serological and histopathological study with special reference to the eye manifestations.** pp. x + 168. Leiden: Stenfert Kroese's Uitg.-Mij. N.V. 19s. 1712

This book is concerned chiefly with toxoplasmosis as it occurs in man and especially with the eye lesions. Part I, however, reviews the literature of the condition both in animals and man. Epidemiology, parasitology and diagnosis are concisely reviewed. About half the book is devoted to the findings in 20 cases which have been studied by the author. There is a good bibliography.—M. C.

FIEBIGER, J. (1947.) **Die Tierischen Parasiten der Haus-und Nutztiere, sowie des Menschen. [The animal parasites of domestic animals and man.]** pp. xii + 436. Wien: Urban & Schwarzenberg. 4th Edit. 1713

In this edition the first section deals with general parasitology, namely the biology of the parasites, mechanism of invasion, immunity, pathology, etc. The second section deals with the specific parasites and covers the protozoa, trematodes, cestodes, nematodes and arthropoda.

There is evidence that the author has been restricted in his access to the literature during the war years and as a result many sections are not up to date. This is possibly most noticeable in the section dealing with the protozoa. The only pathogenic trypanosomes which are dealt with in any detail are *T. brucei*, *T. equiperdum*, *T. equinum*, and *T. gambiense*. Important species such as *T. congolense*, *T. vivax* and *T. simiae* are barely mentioned. In the section on the piroplasmoses, *T. mutans* is included in the Babesiidae and *T. parva* in the Theileridae. *B. gibsoni* of the dog is not mentioned. The description of the Plasmodiidae is disappointing from the veterinary point of view as there is no mention of *Pl. gallinaceum* nor of *Pl. lophurae*, nor of the new knowledge of the life cycle of plasmodium which has been gained as a result of study of these two species in recent years. There are many illustrations, few of which are

original. There is a short bibliography, mainly of works in the German language and most of them of pre-war dates.—M. C.

SERGEANT, ED., & SERGEANT, ET. (1947.) *Histoire d'un marais Algérien. [History of a swamp in Algeria.]* pp. 293. Alger: Institut Pasteur d'Algérie. 1714

This interesting work, a mixture of history, philosophy and science, recounts the rehabilitation by the Pasteur Institute of a swampy malaria infested, practically uninhabited area in Algeria.

The geology, geography and the natural and political history of the district are dealt with. Then the various methods designed to convert this ruined area into thriving farm land are described. These methods included drainage, anti-malarial measures, introduction of improved agricultural methods and trials of new plants and trees. In addition to malaria which had decimated the population, tick-borne babesia, anaplasma and theileria infections were so prevalent that cattle could not be kept. Earlier colonists who had attempted to introduce cattle had met with disaster.

The area was put in charge of the Pasteur Institute in 1927 and to-day is thriving farm land with a healthy population, good crops of cereals, lucerne, beetroots, etc., trees, largely eucalyptus, margosa and casuarina as shelter belts and for supply of firewood, and thriving dairy cattle.

There is a short account of measures adopted to control disease in cattle.

Profusely illustrated, the book will be an inspiration to all concerned with development of tropical and subtropical countries.—M. C.

PEPPERALL, R. A. (1948.) *The Milk Marketing Board.* pp. 106. Wells, Somerset: Clare, Son & Co., Ltd. 4s. 6d. 1715

This book has been written to explain to the general reader the functions of the Milk Marketing Board which was set up in September, 1933, under the Agricultural Marketing Acts of 1931 and 1933, to regulate the sale of milk on a collective basis and is now one of the largest co-operative organizations in the United Kingdom.

The principal aim of the Board has been to guarantee to all milk producers a regular market for their milk, and it has tried to sell this milk in liquid form because it is double or even treble the price of milk converted into cheese or butter. To increase the demand for liquid milk it has encouraged the opening of milk bars, and been associated with the milk-in-schools and industrial milk schemes. However, because of the uneven scale of production it has been found necessary to open 15 factories in which surplus milk is converted into butter, cheese and milk powder.

Linked with this aim to sell more milk has been a determination to market better milk, and by the payment of bonuses the Board has encouraged the production of accredited and tuberculin tested milk. It has also established laboratories for testing the keeping and compositional qualities of milk.

It is assisting farmers to improve the general quality of their herds, by controlling the Milk Recording Scheme and the Artificial Insemination centres managed by the Board, and is helping to improve the standard of nutrition by being associated in a large-scale grass drying project.

The author traces the history of the Board from its inception and refers to special difficulties which were encountered, such as those caused by milk rationing and evacuation, and succeeds in providing an interesting account of the venture, giving a clear general impression of its work and development.—J. O. L. KING.

NAGLIERI, F. [Prof.]. (Undated.) *Approvvigionamenti annuari Mercati ed industrie alimentari di origine animale. [Supply, marketing and industrial use of foodstuffs of animal origin.]* pp. 367. Napoli: Libreria Editrice Universitaria. 1716

A useful survey is given of the industries connected with foodstuffs of animal origin throughout the world, but with special reference to the position in Italy at the present day. The author describes the part played by such foods in the diet of people belonging to various income groups. Economic and political factors affecting supply and consumption are discussed, as well as marketing and storage problems and the various systems of rationing. In the second part of the book, the meat trade is dealt with at length, then the production, storage and marketing of fats, milk, cheese and eggs.

There is a detailed list of contents, but no alphabetical index.—R. MACGREGOR.

HUGHES, A. M. [B.Sc., D.I.C.]. (1948.) *The mites associated with stored food products.* pp. 168. London: His Majesty's Stationery Office. 8s. 1717

A new book on British mites has long been required and the author's publication on the mites associated with stored products goes a long way to filling a serious gap in our literature. Whilst it deals with a limited type of mite fauna it will be of general assistance to those interested in mites of veterinary importance. The general characteristics of the Acarina are clearly described and figured and the keys readily understandable. Parasitic forms are mentioned only in so far as they may be chance inhabitants of stored products by being associated with other mites, insects or rodents.—J. B. CRAGG.

FREAR, D. E. H. [Ph.D., Professor of Agricultural & Biological Chemistry, The Pennsylvania State College]. (1947.) **A catalogue of insecticides and fungicides. Volume I. Chemical insecticides.** pp. x + 203. Waltham, Mass.: The Chronica Botanica Company. \$6.50. (1948.) **Vol. II. Chemical fungicides and plant insecticides.** pp. xii + 153. *Ibid.* \$5.50. 1718

Some time in or before 1943, a research project was adopted by the Pennsylvania Agricultural Experimental Station to find new insecticides and fungicides. It was quite rightly arranged that before research should proceed, a review of existing information should be made, and these books constitute this review of literature on chemical and plant insecticides and fungicides. Some thousands of chemical compounds and some hundreds of plant extracts which had been tested for activity are catalogued.

Volume I, devoted to chemical insecticides, contains particulars of the chemical code system used and then lists the compounds accordingly, each entry showing in abbreviated form their insecticidal action against named insects together with the serial number of the relevant reference, these references appearing in a separate section of the book, which also constitutes the author index. There is also a section on condensation products used as insecticides and one on miscellaneous insecticides not included in the other sections. There are also lists of patents.

Volume II is devoted to chemical fungicides and to insecticides of plant origin, and is otherwise arranged as in the first volume.

It is important to note that the survey only extends up to the beginning of 1944, so the highly important recent advances resulting in the discovery of new potent insecticides are not dealt with. There is only one, vague, reference to D.D.T. and only one to benzene hexachloride.

This catalogue brought up to date would of course have hundreds of references on these two products. In view of this, the value of these books consists in their guidance to work done prior to 1944 and as such, the catalogue is very valuable.

The material is dealt with on a chemical basis, and in order to use the catalogue it is necessary to know not only the chemical name of the compound about which information is sought but also how such a compound is chemically classified for

indexing purposes; for instance D.D.T. is a compound of ethane and the place to look for it is among the E's. Benzene hexachloride was run to ground amongst the B's for benzene, though chemical purists now call it hexachlorocyclohexane, which would put it as a cyclohexane in the C's.

The great value of this catalogue will be appreciated chiefly by chemists attempting to synthesize new insecticidal compounds.—J. E.

CLARK, W. M. [Ph.D., Sc.D.; DeLamar Professor of Physiological Chemistry, The School of Medicine, The Johns Hopkins University]. (1948.) **Topics in physical chemistry.** pp. xv + 738. Baltimore: The Williams & Wilkins Co.; London: Baillière, Tindall & Cox. 55s. 1719

Physical chemistry is here presented with particular reference to the biological sciences. The book is rather extensive in scope for the average medical and veterinary student concerned with an already crowded curriculum, but for those particularly interested in the subject the discursive presentation of fact and principle should prove useful. The special appeal would be to the research worker, who wishes to apply the methods of physical chemistry to his own particular problems, whether they may be in zoology or clinical biochemistry.

The field covered is large and the various aspects of the subject are presented with many examples from current and past research to illustrate the principles involved and their application. The range covered is shown by the chapter headings: The Balance, Measurements of Volume, Density, Sedimentation, Gas Laws, Colligative Properties of Solutions, Phase Distribution, Diffusion, Semi-permeable Membranes, the Law of Mass Action, Electrolytes, Conductivity, Equilibria in Proton exchanges, Protein Solutions, Equilibria of Blood Electrolytes, Thermodynamics, Oxidation—Reduction Potentials, the Glass Electrode, Polarography, Atomic Structure, Isotopes, Refraction and Polarized Light, Stereoisomerism, Spectrophotometry, Luminescence, Colloid Chemistry. Mathematical appendices are provided and there is a good subject index.

The paper is good and the printing pleasant to read.—A. B. PATERSON.

BOOKS RECENTLY RECEIVED

[Notice of recently received books in this list does not preclude review.]

BLOOM, W. (1948.) **Histopathology of irradiation from external and internal sources.** pp. xxv + 808. London: McGraw-Hill Book Co., Inc. 48s.

DARRASPEN, E., FLORIO, R., & JOUBERT, L. (1949.) **Les sérums salés et médecine vétérinaire. [Saline solutions in veterinary medicine.]** pp. 124. Paris: Vigot Frères.

- DÉVÉ, F. (1949.) *L'échinococcose primitive (maladie hydatique). [Echinococcus infection (hydatid disease).]* pp. 362. Paris: Masson et Cie. Fr. 1,000.
- FLYNN, J. E. [Edited by]. (1948.) *Blood clotting and allied problems.* pp. 179. New York: Josiah Macy, Jr., Foundation.
- FREY-WYSSLING, A. (1948.) *Submicroscopic morphology of protoplasm and its derivatives.* (Translated by Hermanns, J. J., & Hollander, M.) pp. 286. New York, Amsterdam, London & Brussels: Elsevier Publishing Co., Inc. \$6.00.
- GALLIEN, L., & ROUX, P. (1948.) *L'insemination artificielle chez les animaux domestiques. [Artificial insemination of domestic animals.]* pp. 266. Saint-Germain, Paris: Presses universitaires de France.
- GOODE, J. S., & RUDDOCK, H. B. (1949.) *Artificial insemination of farm animals.* [Translated from the Russian.] pp. 176. London: Angus & Robertson, Ltd. 42s.
- HADLEY, F. B. (1949.) *Principles of veterinary science.* pp. xi + 521. London: W. B. Saunders Co. 25s.
- HANSON, W. (1948.) *Die Kennzeichnung des Schlachtviehs. [Marking of animals intended for slaughter.]* pp. 56. Stuttgart: Wissenschaftliche Verlagsgesellschaft M. B. H. DM. 2.80.
- Henderson's dictionary of scientific terms. Revised by J. H. Kenneth. (1949.) pp. xiii + 480. London & Edinburgh: Oliver & Boyd. 4th Edit. 32s.
- JEAN-BLAIN, M. (1948.) *Les aliments d'origine animale destinés à l'homme. [Animal products as human food.]* pp. 578. Paris: Vigot Frères.
- LAROUX, P. (1948.) *Constitution chimique et activité des molécules thérapeutiques. [Chemical constitution and activity of substances used in chemotherapy.]* pp. 118. Paris: Masson et Cie.
- MATHER, K. (1949.) *Biometrical genetics.* pp. ix + 162. London: Methuen & Co., Ltd. 18s.
- MIESSNER, H., & SCHOOP, G. (1948.) *Tierseuchen und ihre Bekämpfung. [Control of animal epidemics.]* pp. 366. Hannover: M. & H. Schaper. 7th Edit. DM. 24.
- MOLLISON, P. L., MOURANT, R. E., & RACE, R. R. (1948.) *The Rh blood groups and their clinical effects.* pp. 74. London: H. M. Stationery Office. *Med. Res. Coun. Memo.* No. 19. 1s. 6d.
- NORTHROP, J. H., KUNITZ, M., & HERRIOTT, R. M. (1948.) *Crystalline enzymes.* pp. xxi + 352. New York: Columbia University Press; London: Geoffrey Cumberledge. 2nd Edit. Revised and enlarged. \$7.50, or 42s.
- POTTER, V. R. [Edited by]. (1948.) *Methods in medical research. Vol. I.* pp. xiii + 372. Chicago: The Year Book Publishers, Inc. \$8.00.
- ROSEBURY, T. (1947.) *Experimental air-borne infection.* pp. xi + 222. Baltimore: The Williams & Wilkins Co. \$4.00.
- SCHÖNBORN, G. (1947.) *Die Fleischschau. [Meat inspection.]* pp. 289. Hannover: M. & H. Schaper. DM. 14.
- SEELEMAN, M. (1948.) *Biologie des bei Tieren und Menschen vorkommenden Streptokokken. [Biology of streptococci of animals and man.]* pp. 520. Nuremberg: Hans Carl. DM. 22.
- STEPHENSON, M. (1949.) *Bacterial metabolism.* pp. xiv + 390. London: Longmans, Green & Co. 3rd Edit. 30s.
- TAGAND, R., & BARONE, R. (1948.) *Abrégé d'angiologie du cheval. [Abridged angiology of the horse.]* pp. 168. Lyon: Camille Annequin.
- THIEULIN, G., & VUILLAUME, R. (1947.) *Éléments pratiques d'analyse et d'inspection du lait. [Practical analysis and inspection of milk.]* pp. 248. Paris: Le Lait. 2nd Edit. Fr. 100.
- THORNTON, H. (1949.) *Textbook of meat inspection.* pp. xi + 659. London: Baillière, Tindall & Cox. 50s.
- VORS, J. (1949.) *Grefte ovarienne intra-oculaire chez la lapine castrée application au diagnostic de la gestation. [Intra-ocular grafting of the ovary in the spayed doe as a pregnancy test.]* pp. 72. Paris: Vigot Frères.
- ZIETZSCHMANN, O., & NICKEL, R. (1947.) *Leitfaden der Anatomie der Haustiere. [Guide to the anatomy of domestic animals.]* pp. 112. Wolfenbüttel-Hannover: Wolfenbütteler Verlagsanstalt, Ltd.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

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Commonwealth Bureau of Animal Health, Weybridge. Review Series No. 2. Modes of spread of <i>Streptococcus agalactiae</i> infection in dairy herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944		3s. 0d.
Commonwealth Bureau of Animal Nutrition, Aberdeen.		
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Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh. The semen of animals and its use for artificial insemination. By James Anderson. Spring, 1945		7s. 6d.
Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.		
36.	The grasslands of Latin America. By Miss G. M. Roseveare. Late 1946 ...	20s. 0d.
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Commonwealth Bureau of Soil Science, Harpenden.		
43.	Land classification for land-use planning. June, 1946	4s. 0d.
Commonwealth Mycological Institute, Kew. An annotated bibliography of medical mycology, 1945. 1946		5s. 0d.

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